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ENERGY PRODUCTION AND CONSERVATION ACT OF 1990

HEARING

BEFORE THE

SUBCOMMITTEE ON
ENERGY REGULATION AND CONSERVATION

OF THE

COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

ON

S. 2923

ENTITLED "ENERGY PRODUCTION AND CONSERVATION ACT OF 1990"

AUGUST 2, 1990

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ENERGY PRODUCTION AND CONSERVATION ACT OF 1990

THURSDAY, AUGUST 2, 1990

U.S. SENATE,
SUBCOMMITTEE ON ENERGY REGULATION
AND CONSERVATION,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The subcommittee met, pursuant to notice, at 9 a.m., in room SD-317, Dirksen Senate Office Building, Hon. Timothy E. Wirth, presiding.

OPENING STATEMENT OF HON. TIMOTHY WIRTH, U.S. SENATOR FROM COLORADO

Senator WIRTH. The subcommittee will come to order. We are setting an all-time record for starting a Senate hearing early.

Today the subcommittee will hear testimony on S. 2923, the Energy Policy and Conservation Act of 1990. We have a long list of witnesses, and we want to hear from all sides of the issues before us.

We approach this legislation in the context of a rapidly changing world that is unfolding before us. Changes in the international arena—the collapse of the Berlin Wall, the end of the Cold War—are evoking a dramatic reevaluation about our place in the world order. This process has focused our priorities on a difficult set of economic, environmental, and energy challenges. The nexus of these three challenges is what S. 2923 is all about.

Unquestionably, the approach taken in the legislation is new to many people. For too long we have relied on traditional command and control solutions to our environmental problems. At the same time, we have relied on a free market in the energy arena that does not fairly incorporate the externalities and social costs of the energy we use in most cases.

Today as a Nation that relies on imported oil for more than 50 percent of its consumption and today particularly with the Iraqi invasion of Kuwait, we ought to be a leader in international policymaking on both environment and energy. We have a great deal to do, and we have to think quite differently and more smartly about the way in which we approach both energy and the environment.

This legislation proposes to bring these two together. The scrapping of old tires, the dumping of used motor oil and the glut of old newspapers convinces me that we can and should have a great opportunity to develop market mechanisms to stimulate recycling of these products. If we can figure out how to do that, then it seems to me we are going to be a lot better off.

We have a long list of witnesses, and I am very pleased that we are going to start this hearing off with the Chairman of the Council of Economic Advisors, Michael Boskin. Dr. Boskin has been right at the forefront of efforts to get people to think differently about the environment.

There is a major set of environmental challenges and environmental opportunities. I think the administration started off very well in 1989 with a clean air bill that really changed the way in which we should be thinking about that enormous challenge. Now we have to take that kind of innovative thinking and turn that to some of the other less obvious but, it seems to me, equally promising challenges that we face.

Michael, thank you ever so much for taking time out. By our agreement, you are not going to comment on the specific pieces of legislation but, rather, help to give us an overall framework for the administration's thinking, which I think is very parallel to that of this committee.

Thank you very much for being here.

[The prepared statements of Senators Wirth, Akaka and McClure and the text of S. 2923 follow:]

STATEMENT OF THE HONORABLE TIMOTHY E. WIRTH

Good morning. Today, the Subcommittee will hear testimony on S. 2923, the Energy Policy and Conservation Act of 1990. We have a long list of witnesses and we want to hear from all sides of the issues before us.

We approach this legislation in the context of the rapidly changing world that is unfolding before us. Changes in the international arena -- the collapse of the Berlin Wall, the end of the Cold War -- these changes are evoking a dramatic reevaluation about our place in the world order. This process has focussed our priorities on a difficult set of economic, environmental and energy challenges. The nexus of these three challenges is what S. 2923 is all about.

Unquestionably, the approach taken in the legislation before us is new to many people. For too long, we have relied on traditional command and control solutions to our environmental problems. At the same time, we have relied on a free market in the energy arena that does not fairly incorporate the externalities, the social costs of the energy we use.

Today, as a nation that relies on imported oil for more than 50 percent of its consumption, as a nation that can be the world's leader in international environmental policymaking, as a nation that needs to develop new economic models to prepare for the 21st Century, we need to change course. **We need to recycle the way we think.** And that is what this legislation is all about.

This legislation proposes a marriage of good energy policy, good environmental policy and good economic policy. By harnessing the powers of the marketplace to address our environmental and energy objectives, we can achieve our goals at the lowest possible cost. Indeed, this legislation is intended to encourage the private sector to do well -- while doing right.

The scrapping of old tires, the dumping of used motor oil and the dreadful glut of old newspapers convince me that we must develop market mechanisms to stimulate recycling of these products. The low rate of oil, tire and newspaper recycling can largely be attributed to the fact that these materials frequently have very little, if not a negative, market value -- this, despite the fact that each could be reclaimed for energy production or other uses. Instead, we now discard annually enough used oil to equal 37 Exxon Valdez spills, enough old newspapers to fill 28 million cubic yards of landfill space, and enough scrap tires to go to the top of the Empire State Building 98,000 times.

We've got to get these products out of the landfill and into the living room as new products and new supplies of energy.

Witnesses today will testify that:

1) The reuse of scrap tires would supplant almost 69 MILLION BARRELS OF OIL THAT THIS NATION CONSUMES EACH YEAR;

2) At least another 10 million barrels of used oil is improperly discarded -- when most of it could be reprocessed to save precious petroleum resources and energy;

3) Department of Energy research now shows that old newspapers are a very promising feedstock for clean-burning alternative fuels.

4) And, finally, we intuitively know that more old newspapers can be used to produce our newsprint and other paper products. It has been said that the U.S. is the Saudi Arabia of wastepaper.

These are but a few of the many opportunities that could be realized by developing markets for old tires, used oil and newspapers. S. 2923 proposes a system of market-based incentives to stimulate the demand for these products. The Subcommittee welcomes todays witnesses and we look forward to hearing the experts opinion about how we can improve this legislation and enact it into law.

STATEMENT BY THE HONORABLE DANIEL K. AKAKA
UNITED STATES SENATOR

Hearing before the
Subcommittee on Energy Regulation and Conservation
on "Energy Efficiency through Waste
and Recoverable Materials"

Thursday, August 2, 1990
Dirksen Senate Office Building Room 366

Mr. Chairman, fellow Senators, and distinguished guests and witnesses: It gives me great pleasure to join the committee in receiving testimony and comments from a wide spectrum of witnesses. Since my appointment to the Senate barely three months ago upon the passing of the late Senator Spark Matsunaga -- a personal friend of mine and no doubt to many of you as well, a true gentleman, and a champion of renewable and alternative energies -- I have learned a great deal and received the warmest support from all of you. And as the newest Senator from the State of Hawaii, I want to return your kindness by sharing with you an example from my home state of the very real and exciting possibilities for turning a nationwide headache -- and here I speak of garbage, tons upon tons of waste and towering mountains of refuse -- into a source of clean energy.

On the Island of O'ahu rests Hawaii's answer to solid waste. We call it "H-POWER" -- "H" for Honolulu, and "POWER" for the abundant electricity which lights up 35,000 homes and which would otherwise lie useless as unconverted energy in Honolulu's landfills. I am proud to point to Hawaii's first

HPOWER plant, a waste incinerator and power generator, which represents the cutting edge of waste-disposal technology.

At a time when cities, municipalities, and states across the land are crying out as one landfill after another closes, I say "Look to H-POWER. Consider the benefits!" At a time when mountains of garbage travel aimlessly aboard trains, barges, and ships in search of a landfill and states turn them away, I say, "Look to H-POWER. Imagine the possibilities!"

Americans recycle just 11 to 13 percent of their garbage. In Hawaii, the figure is 15 percent. What do we do with the remainder? Well, since last November, Honolulu's HPOWER plant has been burning 1,800 tons of trash every day while producing 5 to 7 percent of all Oahu's power needs. Of that 1,800 tons of solid waste burnt every day, about 400 tons of ash residue is produced. To put it another way, the volume of trash is reduced by about 70 percent while enough electricity is generated to light 35,000 homes. And that's just the beginning.

I don't mean to speak any longer than necessary. As a wise, old refuse collector once told me, "There's always time to burn waste. But don't ever burn someone's patience by wasting their time." Or something like that. So I return the mike and the floor to you, Mr. Chairman.

# # #

Statement Of
Senator James A. McClure (R-ID)
Ranking Minority Member

Subcommittee on Energy Regulation and Conservation
hearing on
Energy Production and Conservation Act of 1990, S. 2923
August 2, 1990

Good morning. Today the Subcommittee is considering legislation to encourage the recycling of certain kinds of solid municipal waste, namely tires, motor oil and newspapers.

Now while I believe that the goal of the bill is laudable, I am not convinced that the means it proposes is the most effective or efficient system. Moreover, I am concerned that it contains the seeds of both legal and illegal abuses.

The bill would create a so-called "market-based" credit system to tie the recycling of waste to those who produce or import the product originally. While it would appear that this system is modeled on the Clean Air Act amendments' credit trading system, the situation with municipal waste is really very different and requires a different approach.

One aspect of this bill which concerns me greatly, is that although characterized as being "market-based," it really is a command and control system. It ties the recycling of waste to certain persons and to certain recycling uses, giving some an advantage and discriminating against others. For example, the newsprint section explicitly encourages conversion of used newsprint into alcohol, and discourages conversion of newspapers into cardboard boxes, tissue paper, wallboard etc. As another example, the tire section gives four times the benefit for a whole tire reused as compared to a shredded tire burned for energy. And why give twice the benefit to a whole tire burned for energy as is given to a shredded tire burned for energy? I simply do not see any basis for these differentials.

I am also very concerned about the abuse to which this kind of system can be put. In the 1970's we had an analogous system, the crude oil entitlements program, which was thankfully terminated by President Reagan in 1981 as one of his first acts of office. And we all recall the massive abuses of that system, both illegal as well as legal. Recall the small refiner bias which engendered a cottage industry of so-called "teakettle" refineries whose only purpose in life was to earn entitlements credits? Do you recall that the Government gave itself entitlements to subsidize the filling of the Strategic Petroleum Reserve? And, of course, there was the fraud which took place.

These issues only begin to lay out some of my concerns about the pending bill. I look forward to hearing from today's witnesses.

101st CONGRESS
2d Session

S. 2923

To amend title III of the Energy Policy and Conservation Act to conserve valuable natural resources primarily through energy production to enhance energy efficiency, and to clarify the status of materials for energy production under the Public Utilities Regulatory Policy Act and the Federal Power Act.

IN THE SENATE OF THE UNITED STATES

July 26 (legislative day, July 10), 1990

Mr. Wirth introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

---

A BILL

To amend title III of the Energy Policy and Conservation Act to conserve valuable natural resources primarily through energy production to enhance energy efficiency, and to clarify the status of materials for energy production under the Public Utilities Regulatory Policy Act and the Federal Power Act.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Energy Production and Conservation Act of 1990".

TITLE I—ENERGY PRODUCTION FROM USED OIL

SEC. 101. FINDINGS.

The Congress finds the following:

(1) Each year, the United States uses 2.6 billion gallons of lubricating oil. Much, if not most, of that quantity could be recovered for energy production. Used motor oil has an energy value of 145,000 Btu's per gallon.

(2) Used oil, when properly recovered, is a valuable energy production resource. When used as a fuel, it reduces the need to drill for and refine the Nation's limited crude oil supply. When recovered into lubricating oil or other high grade products, production of such products requires only 2.5 percent of the energy of producing fuel and petroleum products from virgin crude oil.

(3) Each year Americans unwisely and needlessly discard more than 400 million gallons of used motor oil—an amount greater than 35 Exxon Valdez oil spills. That amount of oil could reduce the need to import nearly 10 million barrels of crude oil annually. In order to reduce dependence on imported fuels there is a great need to recovery the Btu value of used oils for energy production.

(4) Market-based incentives targeted at energy production from used oil can significantly reduce the amount of used oil needlessly discarded.

(5) The Secretary of Energy requires additional statutory authority to address energy production and, in particular, to apply market-based incentives to energy production from used oil.

SEC. 102. REQUIREMENTS FOR ENERGY PRODUCTION FROM USED OIL.

Section 383 of the Energy Policy and Conservation Act (42 U.S.C. 6363) is amended—

(1) in subsection (c) by—

(A) striking "As soon as practicable after the date of enactment of this Act" and inserting "Not less than 15 months after the date of enactment of the Energy Production and Conservation Act of 1990"; and

(B) striking "National Bureau of Standards" each place it appears and inserting "National Institute of Standards and Technology"; and

(2) by adding at the end thereof the following new subsection:

"(g)(1)(A) Beginning not later than 18 months after the date of the enactment of this section, a producer or importer of 100,000 gallons or more of lubricating oil each year shall either burn for energy production, or refine, using a method described in subparagraph (B), an amount of used oil equal to at least that amount of oil determined by—

"(i) multiplying the lubricating oil produced or imported that year by such person, by

"(ii) the percentage established by the Secretary under paragraph (2).

"(B) A producer or importer of lubricating oil may comply with this paragraph—

"(i) by burning used oil for energy production;

"(ii) by refining used oil for purposes of producing petroleum products;

"(iii) by purchasing credits under the credit system established pursuant to paragraph (3).

"(2) The Secretary each year shall establish a percentage for the uses under paragraph (1). The percentage applicable during the first year that the requirement established by paragraph (1) is in effect shall be a percentage that is 2 percentage points higher than the recovery rate for lubricating oil that exists on the date of the enactment of this section. Such rate shall be determined by using data for 1988 or the most recent year for which data are available. Through the year 2000, the percentage shall be an additional 2 percentage points higher than the percentage for the previous year.

"(3)(A) Not later than 18 months after the date of the enactment of this section, the Secretary shall promulgate regulations to implement these requirements.

"(B) For purposes of this section, the term 'credit' means a legal record of energy production or refining of used oil undertaken in accordance with this subsection that represents an amount of used oil burned or refined for purposes of complying with paragraph (1).

"(C) Exemptions.—(i) This section and the regulations promulgated under this section shall not apply to a facility operated by a person described in subparagraph (B) if—

"(I) in the case of a facility described in (1)(B) (i) or (ii) that burns for energy production or refines used oil into fuel or other petroleum products, the amount of used oil burned for energy production or refined into fuel or other petroleum products each year at the facility is equal to no more than the amount of used oil that the owner of the facility is required to burn for energy production or refine under paragraph (1)(A) for that year: *Provided,* That this clause applies only to a facility in Standard Industrial Classification number 2911 facility that refines at least 10,000 barrels a day of crude oil into petroleum products.

"(II) in the case of a facility described in paragraph (1)(B)(ii), the amount of used oil compounded or blended into finished lubricant products each year at the facility is equal to no more than 10 percent of the lubricating base oil compounded or blended into finished lubricant products each year at such facility: *Provided* That this clause only applies to a facility that compounds or blends lubricating base oil into finished lubricant products as its principal activity and is classified as a Standard Industrial Classification number 2899 facility or a Standard Industrial Classification number 2992 facility.

"(ii) This subsection and the regulations promulgated thereunder shall not apply to used oil that is generated on-site for on-site energy production activities, including storage, use, and transportation, carried out at a facility classified as a Standard Industrial Classification number 4911 facility.

"(D) The Secretary shall promulgate regulations establishing requirements for exempt refineries that refine used oil. The regulations shall cover recordkeeping, testing, and such other matters as the Secretary determines are necessary and appropriate for refining used oil at exempt refineries.

"(4) If the Secretary fails to promulgate the regulations as required by subsection (3), the percentage under paragraph (2) shall be 40 percent until such time as the regulations are promulgated.".

SEC. 103. AUTHORIZATION OF APPROPRIATIONS.

(a) SECRETARY OF ENERGY.—There is authorized to be appropriated to the Secretary of Energy $1,200,000 to carry out section 383 of the Energy Policy and Conservation Act. Such funds shall be used to hire the equivalent of at least 6 additional full-time employees to carry out those subsections, and shall remain available until expended.

(b) SECRETARY OF COMMERCE.—There is authorized to be appropriated to the Secretary of Commerce for use by the National Institute of Standards and Technology $3,000,000 to carry out its responsibilities under this section.

TITLE II—ENERGY PRODUCTION FROM TIRES AND NEWSPRINT

SEC. 201. FINDINGS.

(a) FINDINGS WITH RESPECT TO SCRAP TIRES.—The Congress finds the following:

(1) Of the 234 million scrap tires generated in the United States every year, more than 198 million, or 84.5 percent, are not recovered for their embedded energy or other purposes—but instead are merely discarded.

(2) Each of these tires contains the equivalent of two and one-half gallons of oil; if the 240 million tires that Americans will discard this year were instead used for energy production, they would displace nearly 143 million barrels of crude oil.

(3) Additionally, as many as 5 billion scrap tires have been dumped in illegal and improper tire graveyards across the United States.

(4) Energy production from tires now stockpiled would provide enough energy to heat 19 million households for a year.

(5) Those tires can be burned for their energy content either in a waste-to-energy power production facility dedicated to tire burning, or in a base-load electric utility generating facility. In the latter case, tire fuel and tire derived fuel can provide energy with fewer pounds of sulfur per million Btu's than certain other fuels used for baseload generation of electricity.

(6) Energy production offers the quickest avenue of eliminating the hazards associated with tire piles.

(7) While currently available technology exists to significantly reduce tire stockpiles through energy production and other techniques, scrap tires are underutilized because of adverse economics. It has been cheaper to discard tires than to produce energy.

(8) The Department of Energy, in a publication entitled "Waste Tire Utilization", has concluded that energy production from scrap tires requires additional economic incentives.

(b) FINDINGS WITH RESPECT TO NEWSPRINT.—The Congress finds the following:

(1) A significant portion of the trees harvested from public and private lands is dedicated to the production of newsprint. Below market sales of timber harvested on public lands is a significant drain on the United States Treasury.

(2) 70 percent of old newspaper waste in the United States is not recovered under existing incentives pursuant to the Public Utilities Regulatory Policy Act or other Federal law.

(3) Since old newspapers qualify as waste and biomass under section 3(17)(A)(i) of the Federal Power Act (16 U.S.C. 796(17)(A)(i)), they are a source of energy production from qualifying facilities under that section which can provide a cost-effective use for old newspapers.

(4) State and local newspaper recovery programs have helped create a growing surplus of old newspaper. The biomass from old newspaper can be burned for its Btu content in powerplants.

(5) Old newspapers can produce energy for small power production facilities and baseload powerplants.

(6) The demand for old newspapers needs to be increased to provide incentives for the use of the rapidly increasing glut of old newspaper.

(7) A minimum requirement can be used to stimulate markets for old newspapers for energy production in both small power production and baseload facilities.

(8) Research being undertaken by the Department of Energy shows that using old newspapers as biomass feedstock for fuel alcohol production is currently the most promising technology to produce fuel alcohol from biomass.

(9) In addition to energy production from old newspapers, the production of a ton of newsprint from virgin pulp requires approximately 16,320 kilowatt hours of energy.

(10) The production of a ton of newsprint from old newspapers currently requires only 5,919 kilowatt hours of energy—a savings of 64 percent.

(11) The Secretary of Energy requires additional statutory authority to increase energy production from old newspapers.

SEC. 202. ENERGY CONSERVATION REQUIREMENTS.

(a) AMENDMENT OF ENERGY POLICY AND CONSERVATION ACT.—Part B of title III of the Energy Policy and Conservation Act (42 U.S.C. 6291 et seq.) is amended—

(1) in section 321 by adding at the end thereof the following new paragraphs:

"(19) The term 'producer' with respect to tires means any person who produces tires for an automobile, motorcycle, truck, trailer, semitrailer or combination, or truck tractor. Such production does not include retreading tires.

"(20) The term 'importer' with respect to tires means any person who imports tires, either individually or as part of an automobile or other vehicle.

"(21) The term 'scrap tire' means a tire from an automobile, motorcycle, truck, trailer, semitrailer or combination, and truck tractor, that is no longer usable for its original purpose.

"(22) The term 'scrap tire collection facility' means any facility or entity that voluntarily or involuntarily collects, stores, or otherwise accumulates scrap tires in amounts in excess of 1,000 tires a year.

"(23) The term 'tire fuel' means any use of tires to produce heat in an energy production combustion device designed to burn fossil fuels, including such fuels as coal, oil, and natural gas, regardless of the size or shape of the tire upon entering the combustion device.

"(24) The term 'tire derived fuel' means a tire fuel that is reduced to a 2-inch by 2-inch (or smaller) chip, from which 95 percent of the metal has been removed, and which is being burned to produce energy.";

"(25) The term 'reclaimer' means with respect to tires the owner or operator of a tire-fueled energy production facility or a tire recovery facility who has a permit under subsection 338(b).

"(26) The term 'credit' means with respect to tires a legal record of an activity undertaken in accordance with subsection 338(b) that represents scrap tires used for purposes of complying with that section and subsection 338(a).

"(27) The term 'tire sale and installation facility' means any facility which sells or installs more than 1,000 tires for operation on the highways of the United States.

"(28) The term 'shredded tire' means a scrap tire reduced to 2-inch by 2-inch chips.

(2) by redesignating sections 338 and 339 as sections 340 and 341, respectively;

(3) by inserting after section 337 the following new sections:

"ENERGY PRODUCTION FROM TIRES

"SEC. 338. (a) REQUIREMENTS.—(1) During the period beginning not later than 24 months after the date of the enactment of this section and ending 10 years after that date, a producer or importer of tires each year shall either burn for energy production or otherwise use, using a method described in paragraph (2), an amount of scrap tires equal to at least that amount of tires determined by—

"(A) multiplying the number of tires produced for domestic use or consumption or imported that year by such person, by

"(B) the percentage established by the Secretary under paragraph (4).

"(2) A producer or importer of tires may comply with this subsection by purchasing credits under the credit system established pursuant to subsection (c).

"(3) A producer or importer of tires shall submit to the Secretary, a report on the number of tires produced or imported in each calender year by such person. The report shall be submitted at least once a year, but the Secretary also may require such interim reports under this paragraph as he considers necessary.

"(4) The Secretary shall establish the required percentage and management standards for use under subsection (a). The percentage applicable during the first year that the requirement established by subsection (a) is in effect shall be a percentage that is 5 percentage points higher than the rate for tires that exists on the date of the enactment of this section. The rate shall be determined by using data for 1988 or the most recent year for which data are available. For each of the 10 years thereafter, the percentage shall be an additional 5 percentage points higher than the percentage of the previous year. The percentage shall go into effect automatically and shall be published in the Federal Register.

"(5)(A)(i) Not later than 24 months after the date of the enactment of this section, the Secretary shall promulgate regulations to establish a system under which (I) reclaimers may create credits for scrap tire energy production or other use, and (II) producers or importers of tires may purchase such credits from such reclaimers, for purposes of complying with paragraph (1).

"(ii) The amount of credit that may be created for one scrap tire handled at a scrap tire facility is as follows:

"(I) One-fourth of a credit for one tire burned for energy production after shredding.

"(II) One-half of a credit for one whole tire burned for energy production in an approved manner.

"(III) One-fourth of a credit for one tire shredded.

"(IV) Three-fourths of a credit for one tire reused after shredding.

"(V) One credit for one whole tire reused.

"(B) The Secretary may include such other requirements in the regulations under subparagraph (A) with respect to qualifications for reclaimers, importers, and producers, methods for auditing compliance with the system, and enforcement of the system as the Secretary considers necessary or appropriate for administering the credit system established under this subsection.

"(6) The Secretary shall promulgate regulations to implement this section not later than 18 months after the date of the enactment of this section. If the Secretary fails to promulgate the regulations by that date, the percentage under subsection (b) shall be 60 percent until such time as the regulations are promulgated and shall apply retroactively for each year the regulations are not in effect.

"(b) STATUS AS WASTE.—The generation of credits by facilities having a permit under this section shall not alter—

"(1) the status of scrap tires and scrap tire products (including tire fuel and tire-derived fuel) as a 'waste' under section 3(17)(A)(i) of the Federal Power Act (16 U.S.C. 796(17)(A)(i)); or

"(2) the treatment of whole or shredded tire energy production processing, or disposal facilities as solid waste disposal facilities for purposes of section 142(a)(6) of the Internal Revenue Code of 1986.

"ENERGY PRODUCTION FROM NEWSPRINT

"SEC. 339. (a) REQUIREMENTS.—(1) Beginning not later than 18 months after the date of the enactment of this section, a producer or importer of newsprint each year shall burn for energy production or otherwise use, using a method described in paragraph (2), an amount of newsprint equal to at least that amount of newsprint determined by—

"(A) multiplying the newsprint produced or imported that year by such person, by

"(B) the percentage established by the Secretary under subsection (b).

"(2) A producer or importer of newsprint may comply with this subsection—

"(A) by burning old newspapers for energy production;

"(B) by converting old newspapers into fuel alcohol;

"(C) by de-inking old newspapers for purposes of producing newsprint;

"(D) by purchasing de-inked old newspapers for purposes of combining with shipments of virgin newsprint; or

"(E) by purchasing credits under the credit system established pursuant to subsection (c).

"(b) The Secretary each year shall establish a percentage for use under subsection (a). The percentage applicable during the first year that the requirement established by subsection (a) is in effect shall be a percentage that is 2 percentage points higher than the recovery rate for newsprint that exists on the date of the enactment of this section. The percentage shall be determined by using data for 1988 or the most recent year for which data are available. Each year thereafter, until 2000, the percentage shall be an additional 2 percentage points higher than the percentage of the previous year.

"(c)(1) Not later than 18 months after the date of the enactment of this section, the Secretary shall promulgate regulations to establish a management system under which—

"(A) producers or importers of newsprint may create credits for the use of old newspapers;

"(B) facilities classified in Standard Industrial Classification number 4911 (electric power generating facilities) and qualifying facilities under part II of the Federal Power Act (16 U.S.C. 824 et seq.), may create credits for energy production from old newspapers; and

"(C) producers or importers of newsprint may purchase credits from such reclaimers, for purposes of complying with subsection (a).

"(2) The regulations promulgated pursuant to paragraph (1) shall include:

"(A) Procedures whereby a facility classified in Standard Industrial Classification number 4911 (electric power generation) may generate credits for burning old newspapers for energy production, with a requirement that such a facility maintain records of the receipt of old newspapers and their origin for 2 years after date of receipt.

"(B) A requirement that a facility that produces energy from old newspapers notify the Secretary of its capacity and intent to burn old newspapers, and certify that such burning is consistent with Federal and State requirements for the operation of the facility. The notification shall state the overall capacity of the facility, the capacity in operation during the reporting period, and the portion of capacity utilized to produce energy from old newspapers during the reporting period.

"(C) A requirement that a producer or importer of de-inked newsprint maintain records of the receipt of such newsprint for at least 2 years after date of receipt.

"(3) For the purposes of this subsection—

"(A) the term 'credit' with respect to newsprint means a legal record of activity undertaken in accordance with this subsection that represents an amount of old newspapers used for purposes of complying with this section; and

"(B) the term 'reclaimer' with respect to old newspapers means a producer, importer, or facility described in paragraph (1).

"(d) Not later than 18 months after the date of enactment of this section, the Secretary shall report to the Congress on short- and long-term options for energy production from old newspapers.

"(e) This section applies to any person who produces or imports more than 10 tons of newsprint a year."; and

(4) in section 341(a), as redesignated by paragraph (4)—

(A) by striking "and" at the end of paragraph (3);

(B) by striking the period at the end of paragraph (4) and inserting "; and"; and

(C) by inserting after paragraph (4) the following new paragraphs:

"(4) such sums as are necessary to carry out sections 324(h), 325(r), and 338; and

"(5) $1,200,000, to remain available until expended, to carry out section 339, including the hiring of the equivalent of at least 6 additional full-time employees.".

(b) TECHNICAL AMENDMENT.—The table of contents of the Energy Policy and Conservation Act (42 U.S.C. chapter 77) is amended by striking the items relating to sections 338 and 339 and inserting the following:

"Sec. 338. Energy conservation with tires.
"Sec. 339. Energy Conservation with newsprint.
"Sec. 340. Annual report.
"Sec. 341. Authorization of appropriations.".

STATEMENT OF DR. MICHAEL J. BOSKIN, CHAIRMAN, PRESIDENT'S COUNCIL OF ECONOMIC ADVISERS

Dr. **Boskin**. Mr. Chairman, it is a pleasure to be here. Thank you for accommodating my schedule. As you know, I am going to have to hurry to make my annual testimony to the Joint Economic Committee on the other side of the Capitol in a few minutes. As you indicated, there are several other administration witnesses who will be discussing more of the particulars of the bill.

It is not something that is percolated up to the cabinet councils for discussion, so I am going to confine my remarks to the administration's general philosophy in reconciling the environment and the economy, dealing with environmental issues in a way that is economically efficient. So I am going to discuss those briefly and the views of the administration on the use of economic incentives to achieve energy and environmental objectives.

The President strongly believes, as you indicated by reference to his clean air proposals, in using economic incentives to pursue worthwhile regulatory goals in the environment and other areas where regulation is indeed necessary. The innovative scheme of tradable emission allowances that was included in the President's clean air proposal, subsequently enacted by both the House and the Senate, exemplifies this commitment to this approach.

The President, of course, is not alone in this regard. The Congress and the private sector are increasingly inclined toward using flexible modern-day strategies rather than more inflexible bureaucratic command and control approaches.

The advantages of relying on incentives rather than commands are clear. Command approaches almost always fail to allocate the burden of meeting the overall regulatory goals among sources in a cost effective manner and thus raise the total cost to society of meeting any described goal. In short, they tend to waste skills, capital, and labor resources.

On the other hand, economic incentives almost always automatically reduce the cost of achieving particular objectives. Perhaps more importantly and more subtly, firms subject to market-based regulatory programs can retain their incentive for cost reduction and innovation.

For example, utilities participating in the tradable allowances system under the clean air proposal can always profit from emissions reductions that can be achieved at a cost below the market value of the allowances that would be freed up for sale regardless of how low the emissions already are.

In contrast, a firm subject to a command policy has no incentive to reduce below prescribed levels. In fact, if anything, the incentive is reversed. They would be inclined to follow the command: Keep your eyes and ears open, keep your mouth shut, and do not volunteer. Demonstrating the ability to reduce emissions further runs the risk of triggering more stringent standards.

So both on the simple allocation of the cost in a cost-effective manner and an ability to maintain incentives for continued innovation to reduce costs and improve the environment at lower cost, economic incentives have a clear advantage.

This is not just something that works in economic theory, Senator Wirth.

We have ample evidence that these flexible mechanisms work in practice. Nationally marketable allowances were used during phasedown of the lead content in gasoline with substantial documented savings to society. More recently, a program of tradable permits was adopted to implement our commitments under the Montreal Protocol to phase out the use of ozone depleting chlorofluorocarbons.

Economic incentives can also be used to improve the operation of preexisting regulatory efforts. EPA's bubble policy provides flexibility by allowing owners of industrial facilities to balance more control at one facility with less control in another in order to meet overall emissions targets on a cost effective basis provided that air quality is not adversely affected.

Longstanding EPA policy also allows newer expanded pollution sources that secure sufficient emissions reductions from other local sources to offset their emissions to operate in areas that fail to meet air quality standards. This offset policy uses its flexibility to try to reconcile the desire to avoid exacerbating known air quality problems in nonattainment areas with continued economic growth.

It is important to note, however, that while economic incentives have significant advantages over command and control regulation, their use does not—and I emphasize not—guarantee a program soundness. We should not become so enraptured with the cleverness and power of flexible regulatory schemes that, like the Alec Guiness character in the movie "Bridge Over the River Kwai," we forget to ask whether the program itself is desirable. It would not have been very desirable in that particular instance to have the most efficient bridge built over the River Kwai.

To avoid this trap, it is vital that the goals of any regulatory efforts using market incentives be set so that the benefits from regulation outweigh its cost. Indeed, they should be set so that the excess of the benefits to society over the cost be maximized.

Several elements of a regulatory checklist applicable in many, not necessarily all, contexts can be identified. Programs should be based on a careful analysis of where and to what extent, if any, prices in unregulated private markets fail to account adequately for cost and benefits which may accrue to third parties not involved directly in buying and selling in the markets where the prices are determined. You referred to these with their usual economics term, externalities, earlier, Senator.

Second, with the extent of the problem being addressed very significantly across regions, the regulatory program should not adopt a one-size-fits-all approach. For example, cars sold in Northern Idaho, which has no significant automobile-related air quality problems, should not be required to meet the extremely stringent and costly vehicle emission standards planned to promote attainment of current air quality standards in Southern California.

Allowing for flexibility in regulatory programs to meet local circumstances, a hallmark of the President's clean air proposal and some of the discussion that is going on now in conference about local opt-ins and opt-outs, is also a sensible strategy in many other regulatory contexts.

Third, programs should adopt a product or industry scope that is broadly consistent with the parameters of the problem being addressed. An overly narrow focus can impose extra cost by foreclosing opportunities to pursue low-cost actions in other areas.

Finally, once the basis in the geographic and industry scope of a program are established, the choice among the generic types of economic or market incentives—price schemes, permit schemes, mixed schemes—should reflect the particulars of the situation of the administrative feasibility.

Senator Wirth, thank you once again for giving me the opportunity to appear before this subcommittee. In those cases where significant market failures justify regulatory intervention, failure to adopt market-based approaches which are flexible risk imposing large, unnecessary additional burdens on the economy with no corresponding benefits.

The administration is, therefore, very interested in aggressive application of economic incentives in existing well-established regulatory programs and also in new regulatory programs for which there is a clearly demonstrated need. Your recently proposed bill regarding the reuse of recoverable oil, tire, and newsprint waste will obviously be considered by the administration within this context.

Thank you very much.

Senator WIRTH. Dr. Boskin, we thank you very much. Again, I want to reflect my own appreciation for the work that you have done to help to put an intellectual and a conceptual framework underneath what can sometimes be very loose rhetoric about economics replacing regulation. I think we have to, as you point out, be very careful about the goals that get set and then to be sure that we understand who benefits and who does not benefit in all of this. It takes a kind of rigor, and that, coming from an economist, is greatly appreciated.

Project '88, you will remember, was a first attempt that Senator Heinz and I made to try to provide a framework of the application of marketplace incentives to environmental issues. We had done a lot of work on clean air, and you all had paralleled that with the President's Clean Air Act.

You might be interested to know that this summer we are going forward with three new channels on this. One is to look at economics in the public lands to see if we ought to think about the way in which we manage our public lands and look at those resources through a different kind of a lens. That is uncovering a lot of very interesting hidden subsidies and a lot of other benefits that nobody has talked about.

Second, with the help of Ron McHugh, who has been on my staff on loan from EPA and also worked on the House side for Congressman Torres, our next witness, we have a second package of recycling opportunities which are coming forward, some of which are reflected in this legislation.

Third, we are taking a first shot at trying to look at global warming, global atmospheric change and what are the economics involved in that. Now as we look at it, there has been a lot of economic talk. We are trying to pin that down to some quite specific understanding, better understanding of externalities, international markets, and so on. This, we hope, will all be into a package for the opening of the next Congress. Again, as we tried to do with Project '88 initially to have that ready for the Congress that started in 1989, we hope that this will be ready in 1991.

It is a very interesting set of opportunities, and we will forward those on to you when they are done.

Dr. **Boskin**. I will look forward to receiving and analyzing them and giving you the best comments I can.

Senator **Wirth**. Thank you very much. I know you have to head back across the Hill for the Joint Economic Committee. We really appreciate your being here. Good luck, and thanks ever so much.

Dr. **Boskin**. You are welcome. I think you have several administration witnesses who know more about the specifics of the bill than I do.

Senator **Wirth**. Thank you very much, Michael. We will talk to you soon.

Our second witness this morning is a valued colleague and friend, Congressman Torres from California who on the House side has been leading the battle on the economics of recycling in particular. I think it is fair to say that you probably introduced this legislation before Senator Heinz and I had a chance to do any of these over on this side. We greatly appreciate your being here.

I want to take this opportunity as well to thank Ron McHugh who is working with you and working over here for us. He is headed back to EPA, but I just wanted to say for the record what a good job Ron has done. We greatly appreciate the great contribution he has made in building bridges as well between the House, the Senate, and the administration.

Congressman Torres, thank you ever so much for being here. Once again, we greatly appreciate your work in these areas.

STATEMENT OF HON. ESTEBAN E. TORRES, U.S. REPRESENTATIVE FROM CALIFORNIA

Mr. **Torres**. Thank you, Mr. Chairman. Thank you for your kind words about our friend, Dr. McHugh, who, indeed as both of us know, has played an important role both in the House and the Senate in spearheading along with us this very fine legislation.

I have with me today one of his colleagues who has been most helpful and is on my staff, Ms. Fran McPolan. The two of them have worked energetically to make sure that this kind of legislation gets attention.

I am happy to be here today. I want to congratulate you for assuming the chairmanship of this most important Senate subcommittee. I know that our legislation is in good hands with you at the helm. I also appreciate your having accommodated me so early in your hearing, in that we have a session in the House coming up shortly. I will be most brief and succinct in my comments. Of course, I am pleased to be here today to talk about economic incentives to solve some of our most severe environmental and energy problems.

As you know, Mr. Chairman, I have been pleased to introduce in the House four pieces of legislation which are the companion pieces to yours here in the Senate.

The legislation that we have proposed would use market forces to increase recycling of used oil, newsprint, tires; and just last week, Mr. Chairman, we introduced legislation to increase recycling of lead acid batteries.

Now the approach that is outlined in these bills, while radically different from the traditional command and control approach that you spoke about earlier that Government has often used, is being well received in Congress. I have to say that. The ideas proposed in this legislation are a major breakthrough in the management of solid and hazardous waste.

The Consumer Products Recovery Act tackles the problem of oil which is not recycled by using market incentives to lower the cost of recycling. The Consumer Products Recovery Act would require oil manufacturers to share responsibility for recycling by buying oil back from the re-refiners or buying recycling credits to show a certain percentage had been properly recycled.

Just let me briefly talk about newsprint. The Newsprint Recycling Incentive Act would mandate that all newsprint manufactured and imported into the United States contain a certain percent of recycled content.

Rather than introducing the heavy hand of Government regulation into the Nation's newsrooms, this bill would require that newsprint manufacturers who supply newsprint to newspapers comply with the mandates of the law. If the manufacturer does not have the capacity to achieve the mandated percentage of recycled content, they will be able to purchase recycling credits from those manufacturers with an excess capacity.

Now the recycling of lead acid batteries has varied widely over the past 20 years, and it is all fixed to the fluctuations in prices of lead. That has really determined the amount of recycling that takes place. While this may seem like pure market economics, the current battery recycling system does not include the environmental cost of lead exposure. As we all know, even in small doses the lead is highly toxic.

The Battery Recycling Incentive Act will put a mechanism into place that will guarantee a high rate of recycling no matter what the price of lead.

The legislation that we have introduced would oblige battery manufacturers to produce batteries with an annually increasing percent of recycled lead. If the manufacturer is not able to achieve the percent content necessary, they will be able to trade recycling credits from manufacturers who have used an excess amount of recycled lead.

On to another point. The Tire Recycling Incentive Act has been proposed because of the severity of the tire pile problem in the United States. We know that every year Americans generate over 250 million scrap tires, 85 percent of which are either landfilled, stockpiled or illegally dumped in our streams, lakes, and roadsides. It is estimated that there are tires out there in the amount of some 3 billion lying about.

The Tire Recycle Incentive Act would reverse this situation. It would create a system where the manufacturers of the product would see to it that an increasing percentage of their product was recycled. The manufacturers could accomplish this goal by either using the reclaimed rubber from used tires directly into the manufacturing process or by purchasing those recycling credits from a tire recycler.

I see from your list of witnesses that later on the distinguished Mayor from one of my California cities, Palm Springs, Mr. Bono, will be here to talk about the use of recycled tires in the application of road paving in and around Palm Springs. That, I am sure, will speak to the tremendous breakthrough in transforming this product from a discarded tire into various ways and alternatives that can be used in this country.

As a matter of fact, Mr. Chairman, I have with me today a recycled tire with recycled rubber. This is a tire that is now in the marketplace. Once again, it really points out the utility of how we can take discarded tires using recycled rubber and incorporate it into a tire, which I am sure creates, as you and I know, another type of income stream into the economics.

These items all have one thing in common. They cost more to recycle than to replace, and as a result they are being needlessly and wastefully disposed of.

So by using economic incentives to tackle the pollution problem, we can be assured of meeting our responsibilities to protect the environment. The system that we have proposed allows a minimum amount of Government interference but with a maximum amount of environmental gain, something, Mr. Chairman, for which we are all striving.

Mr. Chairman, I want to thank you again for honoring me and inviting me here today. I want to commend your foresight and leadership as well as that of our colleague, Senator Heinz, in carrying this issue forward in this August body.

Once again, I thank you for your attention and your leadership. I am sure that in the not-too-distant future, hopefully under Project '88 this summer, as we mentioned, our paths will cross again and we will work together.

Thank you, sir.

Senator WIRTH. Thank you, Congressman. Thank you very much.

We have, as you have seen, a very interesting mix of witnesses today. We will get reactions from the administration, and then we are going to sector by sector.

On the oil recycling legislation, we have gotten really a very positive response from API and the energy community over all. It seems to make a great deal of sense to them, and they really understand it. Maybe it is because they go through the oil bust and boom and they deal with numbers all the time, and this makes a great deal of sense.

We have gotten a more neutral response from the newspaper people, some positive, some negative. I think that is up from overwhelmingly negative when we first started out, and we seem to be making sense in understanding their problems and their concern.

Then unfortunately, sort of bringing up the rear is the response of the tire industry. I will just give you a quote as to what some of the people said this morning: "It has always been understood within our industry that tires do not cause problems when properly disposed of in landfills. They are not chemically active and do not add harmful compounds to the environment"—really neglecting entirely the fact that if you talk to anybody in New Jersey, Connecticut, or Rhode Island about what is happening to their landfill space, you learn they are going to be history in a short period of time and the problems the tires cause there, must less tire mountains in California.

I thought I would just give you some things that you could think about on your way back.

In addition, beginning in the mid 1980's, many States began considering legislation to deal with scrap tire disposal. RMA and member companies have taken an increasingly active role in the State level activity, and the summary of all that is we ought to do this on a State-by-State basis.

Mr. Torres. I think that, for one, the tire manufacturers probably need extensive education as to the process of how this can really work. I know there is resistance on their part. I would think that they would initially do so, but eventually I think they will come around. This is an important aspect for the environment of the country.

I know that tire recyclers are extremely elated about this type of legislation, and I trust that they will be helpful in this educational process. I want to remind you, Mr. Chairman, that the RCRA markup on September 15, 1990 is a deadline that we have to meet, and I would hope that by that time our good friends in the tire industry would see to it that they are in support of our legislation.

Senator Wirth. I hope that we do hear from them a little bit more than that this is a problem and it ought to be done on a State-by-State basis. I think we have a way to go, and I just point that out, not being critical of them but, rather, to say that there are different levels of understanding of this from different industries, and it is going to be an interesting morning.

We know that you have to head back across the Hill. I really appreciate your coming over this morning, Congressman Torres. I thank you for your very good work and wish you good luck in the RCRA markup and in working your way through the Energy and Commerce Committee, that sort of quiet and calm bastion of Congressional action over there. With John Dingell at the helm, everything is always calm and quiet, is it not?

Mr. Torres. Thank you, sir. On that note, I shall take leave with my recycled tire.

Senator Wirth. Great. Thank you very much.

Our first panel this morning includes three witnesses on behalf of the administration, and I hope they will join us at the witness table: Mr. B. Reid Detchon, Principal Deputy Assistant Secretary for Conservation and Renewable Energy in the Department of Energy; Dr. Richard Morgenstern, Director of the Office of Policy Analysis, EPA; and Mr. Douglas Bernard, the Chief of Demonstration Projects Division, Office of Highway Operations at the Federal Highway Administration.

Gentlemen, we are delighted to have you here this morning. As we told you, we are going to have a very, very busy morning. As we told your offices, we are going to run on a timer and see if we can have you make your statements in 5 minutes. We are using modern technology of a small set of red, orange, and green lights. If you are colorblind, let us know. The lights will go off and on, and

I hope that is all right with you. I hate to constrain us in this way, but we will not make it through the day if we do not do that. So we will run on a 5-minute timer, and the orange light will go on when there is 1 minute remaining.

Reid, why not start with you, if we could do that, to receive the Department of Energy's response and then move to the EPA and then to the Department of Transportation.

Gentlemen, thank you very much for being here. These are issues familiar to you. Reid, you and I, and Dr. Morgenstern, have talked about these kinds of issues and approaches, so you are very familiar with this. We are greatly appreciative of your coming up and being so willing to testify.

STATEMENT OF B. REID DETCHON, PRINCIPAL DEPUTY ASSISTANT SECRETARY, CONSERVATION AND RENEWABLE ENERGY, DEPARTMENT OF ENERGY

Mr. **Detchon**. Thank you, Mr. Chairman. I will attempt to confine myself to 5 minutes. I appreciate the opportunity to be here.

The strongest single message that we have heard in our pulse-taking of the American people in development of the National Energy Strategy is the need for increased energy efficiency. Energy efficiency can equally well be termed energy productivity, because making better use of any of our resources, including waste, is fundamental to improving our competitiveness as a nation.

Energy is required to make raw materials into finished products, and thus all manufactured products contain a measure of embodied energy. As we attempt to make our manufacturing processes more energy efficient and economically competitive, the amount of that embodied energy can be a critical variable.

Our Office of Industrial Technologies is charged with finding ways to minimize the use of energy in industrial processes. This can mean reducing the direct energy inputs to a process, reducing the indirect energy inputs by streamlining the process to reduce the amount of raw materials needed, or by recovering the energy remaining at the tail end of the process either in the waste stream or embodied in the products themselves.

Thus, recycling and waste minimization issues are critical not only to our environment but also are closely linked to energy policy.

We applaud the intent of S. 2923, which is to encourage the reuse of waste tires, motor oil and newsprint and thus lessen their net energy and environmental impact. You are to be commended for seeking a solution that attempts to tap into the power of the marketplace to solve these problems. The approach proposed in the bill, however, is so cumbersome and intrusive into the marketplace, in our judgment, that we must oppose the bill.

We believe that a preferable solution is to develop technologies that can make reuse of these materials more economically attractive and thus achieve the same goal at less cost and disruption to the economy.

The word "recycling" in this context, I should say, should encompass the combustion of waste for energy. The simple incineration of waste is itself a waste, a waste of the heat energy embodied in the products being burned. The combustion of waste to produce energy, however, is a form of recycling, the recovery of energy to produce more energy to produce more products. In some cases this sort of recycling can make more sense than other methods of reusing a product. The three products under consideration today illustrate this point to varying degrees.

In this context I might note that we have an initiative under way to encourage the use of municipal solid waste to produce energy. We intend to work with industry to characterize the emission products from combustion of all major municipal waste streams, including the three items on which this hearing is focused. We have asked Congress to reprogram $2 million in fiscal year 1990 funds for these efforts but have not yet received the approval of the Senate Appropriations Committee for that.

Let me now address briefly each of these commodities in turn. The durability that gives tires their value also makes them difficult to decompose. As a result, used tires are long-lasting disposal problems. They are unsightly environmental threats. They are fire hazards and breeding grounds for insects like mosquitoes. In landfills, tires are a significant problem unless slit or shredded.

There are several ways, however, to reuse tires. Retreading of sound tire carcasses is a commercial business. In addition, tires have been used as an asphalt additive, used in artificial fishing reefs, used for erosion control, and used for road bases as a substitute for coarse aggregate materials. Whole tires are being successfully burned in California, and tire-derived fuel is being burned successfully with coal in boilers. Tires can be burned at an MSW facility but generally are not accepted in truckload lots because of their combustion characteristics.

Currently, waste tire reuse is only marginally attractive economically because all of the commercial technologies use tire rubber to substitute and thus compete with relatively low-value materials. For example, using tires as a fuel generally replaces low-cost coal, and asphalt-rubber paving uses tire rubber to compete with low-priced paving materials.

In addition, the siting of tire combustion plants can be difficult and controversial within a community. We know of just one successful energy conversion plant currently in operation using whole tires, Oxford Energy of Modesto, California. I believe you will be hearing from them later today. There are no commercial tire pyrolysis plants operating.

We believe it would be economically more attractive to use waste tires to displace higher value materials.

I see the yellow light coming on, so I am going to have to move quickly.

We are working with a new technology to displace more expensive plastics, both elastomers and polymers, with waste tire rubber that is ground and surface treated. We believe that new composites with better properties could economically use as much as 50 percent of the waste tires disposed of annually in the United States.

With regard to motor oil, improper disposal is a national problem, but a significant portion, as much as 85 percent, is currently being reused. The cost of collecting and reusing that additional 15 percent may be quite significant. We have sponsored a number of research projects on waste oil recycling which are enumerated in our testimony.

With regard to newsprint, the markets for newsprint have been very volatile over the years and currently are quite low because of a glut on the market. Let me point out, though, that from an energy perspective, the use of newsprint as a primary energy source supplies 8,000 Btu's per pound while the process of recycling used newsprint into new newsprint saves just 2,000 Btu's per pound. Thus, newsprint would have to be recycled four times to save as much energy as is produced by combustion.

However, the number of times newsprint can be recycled is limited by the fact that it loses 15 percent of the fiber with each cycle. In addition, the energy benefits of recycling are limited by the fact that virgin newspaper mills obtain their energy from waste bark and other wood waste, while recycling mills generally use energy from fossil sources. We are looking in this area as well at developing newsprint into higher value materials such as ethanol.

With regard briefly to the legislation, the objective we enthusiastically support; however, in requiring producers and importers of these products to burn or otherwise use a fixed percentage of the annual volume of these products, we believe we would be setting up a difficult process to administer.

The Department of Energy is not primarily a regulatory agency. We are a technology agency, and we recoil at the prospect of creating the kind of bureaucratic infrastructure that would be required to monitor compliance with these provisions. We believe they would be quite burdensome to the industries involved and economically inefficient.

We would emphasize instead the development of the technology necessary to make these products more economically attractive for reuse. For these reasons, we oppose the bill.

Mr. Chairman, I will conclude there and pass on to my colleagues.

[The prepared statement of Mr. Detchon follows:]

Statement of B. Reid Detchon
Principal Deputy Assistant Secretary
Conservation and Renewable Energy
U.S. Department of Energy

Subcommittee on Energy Regulation and Energy Conservation
Committee on Energy and Natural Resources
United States Senate
August 2, 1990

Mr. Chairman and members of the Committee, I appreciate the opportunity to appear today to discuss the Department of Energy's views on resource recovery issues for tires, motor oil, and newsprint and to comment on S. 2923, the Energy Production and Conservation Act of 1990.

The strongest single message that emerged from DOE's "pulse-taking" of the American public for the National Energy Strategy was the need for increased energy efficiency. Energy efficiency can make economic as well as environmental sense. It could equally well be termed energy productivity, because making better use of any resource, including wastes, is fundamental to improving our competitiveness as a nation.

Energy is required to make raw materials into finished products; thus, all manufactured products contain a measure of embodied energy. As we try to make our manufacturing processes more energy-efficient and economically competitive, the amount of that embodied energy can be a critical variable.

Our Office of Industrial Technologies is charged with finding ways to minimize the use of energy in industrial processes. This can mean reducing the direct energy inputs to a process, reducing the indirect energy inputs by streamlining the process to reduce the amount of raw materials needed, or recovering the energy remaining at the tail end of the process, either in the waste stream or embodied in the products themselves. Thus, recycling and waste minimization issues are critical not only to our environment, but also are closely linked to energy policy.

We applaud the intent of S. 2923, which is to encourage the reuse of waste tires, motor oil, and newsprint and thus lessen their net energy and environmental impacts. However, the approach proposed is so cumbersome and intrusive into the marketplace that we must oppose the bill. We believe that a preferable solution is to develop technologies that can make reuse of these materials more economically attractive and thus achieve the same goal at less cost and disruption to the economy.

At DOE, we are working to identify promising waste minimization technologies that can reduce energy use, improve energy productivity, and reduce environmental impacts. Recycling alternatives must be compared on a life-cycle basis for energy, environmental, and economic impacts. With this perspective, we can determine whether economic incentives or disincentives would encourage more efficient use of our resources.

The word "recycling" in this context should encompass the combustion of waste for energy. The simple incineration of waste is itself a waste -- a waste of the heat energy embodied in the products being burned. However, the combustion of waste to produce energy is a form of recycling -- the recovery of energy to produce more energy to produce more products. In some cases, this sort of recycling can make more sense than other methods of reusing a product. The three products under consideration today illustrate this point to varying degrees.

In January DOE announced an initiative to encourage the use of municipal solid waste (MSW) to produce energy. The initiative is aimed at working with industry to characterize the emission products from combustion of all major municipal waste streams, including the three items on which this hearing is focused. DOE will also collect and publish data on the energy impacts of landfills, recycling, and waste combustion technologies. We have asked Congress to reprogram $2 million in FY 1990 funds for these efforts, but have not yet received the approval of the Senate Appropriations Committee.

Each of the three commodities addressed in this legislation -- tires, motor oil, and newsprint -- has a unique set of issues associated with it. These include technology issues, economic issues, and other concerns. I will address each of these commodities in turn:

TIRES--The durability that gives a tire value also makes it difficult to decompose. As a result, used tires are long-lasting disposal problems. Tire piles are unsightly environmental threats. They are fire hazards and breeding grounds for insects like mosquitoes. In landfills tires are a significant problem unless slit or shredded.

However, there are several ways to reuse tires. Retreading of sound tire carcasses is a commercial business. In addition, tires have been used as an asphalt additive, used in artificial fishing reefs, used for erosion control, and used for road bases as a substitute for coarse aggregate materials. Whole tires are being successfully burned in California, and tire-derived fuel is being burned successfully with coal in boilers. Tires can be burned in an MSW facility but generally are not accepted in truckload lots because of their combustion characteristics.

Currently waste tire reuse is only marginally attractive economically because all of the commercial technologies use tire rubber to substitute for (and thus compete with) relatively low-value materials. For example, using tires as a fuel (either whole or chopped) generally replaces low-cost coal; and asphalt rubber paving uses tire rubber to compete with low-priced paving materials. In addition, the siting of tire combustion plants can be difficult and controversial within a community. We know of just one successful energy conversion plant using whole tires -- Oxford Energy of Modesto, California. There are no commercial tire pyrolysis plants operating. It would be economically more attractive to use waste tires to displace higher-value materials.

A new technology is being developed by Air Products and Chemicals, Inc., of Allentown, Pennsylvania, with the support of DOE, to displace more expensive plastics (both elastomers and polymers) with waste tire rubber that is ground and surface-treated. New composite materials would result from this technology. For example, fork-lift tires presently made of molded urethane could be made with a chemically bonded composite of urethane and ground waste tire rubber. The waste tire rubber would replace some of the urethane at lower cost and provide better wet traction. We believe that new composites, with better properties, could economically utilize a substantial portion of the waste tires disposed of annually in the U.S. -- up to 50 percent if the composites captured the entire market.

MOTOR OIL--Improper disposal of waste oil is a national problem. Each year millions of gallons of used motor oil are discarded improperly and cause environmental damage. Various states have different regulations on the handling of waste engine oil: California considers waste engine oil a hazardous waste, but many states have no regulations on waste oil. Few states have waste oil collection facilities for individuals, but do-it-yourself oil change (the principal cause of improper disposal) is decreasing.

A significant portion of waste oil is collected commercially for two markets -- fuel oil and re-refined lubricating oil. Waste oil can be burned and is being used as a substitute for fuel oil in some facilities. Re-refining may be more attractive economically, because the base feedstock and additives are expensive. Many waste oil refineries went bankrupt in the 1980s, however, when they overestimated refining feedstock and re-refined oil markets and underestimated the costs of environmental controls for sludge and wastes DOE cooperated with industry to develop a new hydrotreating re-refining technology that eliminated sludges and some other wastes and is the basis for modern re-refining facilities. However, there remains a reluctance to invest in the business because of the many failures in the past.

DOE has also supported other research projects in waste oil recycling:

> One study analyzed the properties of re-refined oil for comparability to new oil, leading to a simplified set of test parameters to measure used oil lubrication properties and predict its performance in engines.

> DOE has monitored re-refining operations for North Carolina's used oil recycling program, at a Booth Oil Company re-refinery, and at a Lakewood Oil Service re-refinery to determine the input/output quality of the used oil.

> Also, a study was conducted to determine the fate of possibly hazardous contaminants during the re-refining process.

DOE currently is examining a number of additional research areas which could have an impact on the costs and benefits of used oil recycling.

NEWSPRINT--In 1988, the last year for which we have data, 4.8 million tons or roughly 35 percent of the used newsprint in the U.S. was recovered and recycled into new paper or exported. In 1988, we estimate that about 1.5 million tons or roughly 11 percent of used newsprint was burned in various facilities as part of mixed municipal solid waste to produce energy.

Historically, waste newsprint has had very volatile markets, with prices ranging from a high of $40 a ton to prices that are negative -- that is, one must pay to have used newsprint hauled away.

From an energy perspective, the use of newsprint as a primary energy source supplies 8000 Btu per pound, while the process of recycling used newsprint into new newsprint saves 2000 Btu per pound. Thus, newsprint would have to be recycled four times to save as much energy as is produced by combustion. However, the number of times newsprint can be recycled is limited by the fact that it loses 15 percent of the fiber with each cycle. In addition, the energy benefits of recycling are limited by the fact that virgin newspaper mills obtain their energy from waste bark and other wood wastes, while recycling mills generally use energy from fossil sources.

New processes could increase the use of mixed or source-separated newsprint. For example, the adaptation of fluid bed combustion to mixed MSW could reduce the capital cost of combustion facilities while achieving the same capture of sulfur and chlorine compounds. In addition, used newsprint should be a good feedstock for conversion to ethanol through processes under development in the Department. Research results indicate that newsprint inks will not inhibit enzyme production as they did in early experiments since modern paper uses new inks that do not have lead or cadmium as a base and the biocides have changed.

Environmentally, the worst management of waste newsprint is to landfill it without landfill gas recovery. Although papers from the 1930s have been recovered from landfills in a readable condition, in fact much of it degrades quickly to the greenhouse gases carbon dioxide and methane in equal proportions. Since one molecule of methane has the same greenhouse effect as 30 molecules of CO_2, and since combustion produces only CO_2, using waste newsprint for energy effectively reduces its greenhouse impact by a factor of 15.

It is argued that recycling a ton of used newsprint into new newsprint saves 17 trees. However, this does not necessarily result in a net reduction in CO_2 emissions. If those 17 trees are in a mature forest, they are in a state of CO_2 equilibrium, with equal amounts of carbon being added to the mass of the tree and decaying to carbon dioxide. Combustion of newsprint, on the other hand, may replace a fossil fuel with a renewable one.

Finally, recycling requires disposal of deinking slops and short fiber residues, and chlorine is needed to bleach used paper fiber. The industry currently is conducting research to find a substitute for chlorine, the use of which can produce hazardous wastes.

In short, the choice between recycling and combustion of waste newsprint is not a simple and straightforward one and should be evaluated on a life-cycle basis, while the use of waste newsprint as a feedstock for ethanol may be a clear winner. Equal competitive access of all technologies to used newsprint will help achieve the most important goal, which is to minimize landfill disposal.

S. 2923--This legislation attempts to encourage the reuse of waste tires, motor oil, and newsprint and thus lessen their net energy and environmental impacts. To do this, it requires producers and importers of these products to burn for energy production or otherwise use a fixed percentage of their annual volume of these products.

The Department of Energy is not primarily a regulatory agency, we are a technology agency; and we recoil at the prospect of creating the kind of bureaucratic infrastructure that would be required to monitor compliance with these provisions. We believe they would be extremely burdensome to the industries involved and economically inefficient. We would emphasize instead the development of the technology necessary to make these products more economically attractive for reuse. For these reasons, we must oppose the bill.

Mr. Chairman, in conclusion, we are working with industry to develop technologies which can provide our economy with additional waste minimization options, while allowing the market to decide which options to invest in and commercialize. This reflects our attempt to be as aggressive as possible in encouraging energy efficiency without disrupting the effective functioning of the market. We would welcome the opportunity to work with this Committee to further these ends.

This concludes my statement. I would be happy to answer any questions you may have.

Senator **Wirth**. Thank you very much.

Dr. Morgenstern.

STATEMENT OF DR. RICHARD D. MORGENSTERN, DIRECTOR, OFFICE OF POLICY ANALYSIS, ENVIRONMENTAL PROTECTION AGENCY

Dr. **Morgenstern**. Thank you, Mr. Chairman. I am pleased to be with you today, and I will make a few basic points in summarizing my testimony.

Let me say at the outset that we at EPA applaud the general approach to economic incentives adopted in your bill, S. 2923. We in the administration have proposed and both houses of Congress have now adopted essentially similar versions of the Clean Air Act embodying economic incentives. The Emission Trading Program contained in the acid rain portion of the bill is expected to reduce compliance costs by about 20 percent and cut about $1 billion from the cost of complying with the ambitious environmental goals of that bill.

We at EPA are confident that these Clean Air Act economic incentives will prove to be successful, and we also are confident that a broad range of incentives will ultimately find wider application in the pursuit of environmental protection.

The threshold question raised by your bill and one we are now considering is whether new Federal initiatives are needed to shift the management of newsprint, used oil and tires further away from disposal and more toward recycling and energy conversion than is occurring at the present.

Do the health or environmental risks from disposal justify providing incentives for recycling or combustion?

Are there market failures that require the Federal Government to play an expanded role in building demand for recyclable or combustible materials beyond existing procurement efforts?

If the answer to either of these questions is yes, then we believe the system should be designed to work as efficiently as possible through, for example, the kind of mechanisms contained in your bill; that is, credit systems, marketable permits or other market devices.

We also believe that any new initiatives must not in themselves have the effect of favoring practices that pose a greater risk to human health in the environment. Thus, at a minimum, the air emissions from the combustion of waste materials, especially used oil, should be carefully studied and perhaps controlled before qualifying for incentive credits.

As you know, EPA has articulated a general policy that establishes a presumptive preference, all else equal, favoring source reduction, reuse and recycling over energy recovery. We also believe, however, consistent with the Department of Energy, that the selection of an appropriate waste management option for specific materials and applications should depend on a full life cycle cost analysis, including all environmental externalities.

While we do not advocate a decade-long period of study and debate as was the case with acid rain, our problem, quite frankly, is that we do not know the answers to many of the questions I have posed. We do not know with confidence the real risks posed by many existing waste management practices, and we do not know the risks posed by many of the solutions.

Reluctant as I am to appear before you as an EPA witness and say we need more time to study the problem, I firmly believe that more basic information is needed about the nature of the problem and particularly the nature of the solutions before new Federal action is taken.

Numerous studies are under way in the agencies, in the Office of Solid Waste and in my own office, to address these issues, and we are also on track to issue by the end of the year final regulations for air emissions from municipal waste combustors and final standards for the location, design, operation and closure of municipal solid waste landfills in keeping with the statutory mandate included in the Hazardous and Solid Waste Amendments of 1984.

We anticipate that these new requirements will lead to the closure of some older facilities and increased costs at the remaining sites as operators upgrade to meet the new standards. Thus, this process will undoubtedly encourage alternatives to land disposal such as recycling and raise further interest in waste to energy programs.

A final point I want to touch on which has been raised in discussions with committee staff concerns the role that EPA might play in any new market-oriented program that would be adopted by Congress. Since we have broad statutory authority to protect human health in the environment and specific authorities to address municipal waste streams which include, of course, rubber tires, newsprint and used oil, we feel that we would need to be involved in a fairly major way in the design and oversight of any new program to address these waste issues.

In sum, then, we applaud the market orientation of your approach but are not prepared, for the reasons I have outlined, to support today any specific new Federal proposals to address these waste streams.

Thank you.

[The prepared statement of Dr. Morgenstern follows:]

TESTIMONY OF
RICHARD D. MORGENSTERN
DIRECTOR, OFFICE OF POLICY ANALYSIS
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON ENERGY REGULATION AND CONSERVATION
OF THE
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

AUGUST 2, 1990

Mr. Chairman and Members of the Subcommittee, I am Richard D. Morgenstern, Director of the Environmental Protection Agency's Office of Policy Analysis. I am pleased to be with you today to discuss with you the energy and environmental implications of the reuse, recycling, and combustion of rubber tires, newsprint, and used oil. These waste products are currently managed in a variety of ways. They can either be deposited on the land, recycled into new products, incinerated, or used as fuel to generate electricity or process heat.

The threshold question that EPA is considering is whether new federal initiatives are needed to shift management of newsprint, used oil, and tires further away from disposal and more toward recycling and energy conversion than is occurring at present. Do the health or environmental risks from disposal justify providing incentives for combustion or recycling? Are there market failures that require the federal government to play a role in building demand for recyclable or combustible materials beyond existing procurement efforts? We have not yet arrived at answers to these questions. If the answer to either of these questions is yes then we believe the system should be designed to work as efficiently as possible through, for example, the use of marketable permits, credit systems, or other market devices. Finally, EPA's policy establishes a presumptive preference that, all things being equal, favors reuse and recycling over energy recovery; however, the selection of appropriate waste management options for specific materials will depend on a life cycle analysis that takes into account environmental externalities. Although EPA studies are still in progress on these complex issues, in my remarks today I hope to give you an indication of some of our current thinking.

FEDERAL ROLE

Risk to Human Health and the Environment

Since federal action is often triggered by activities that pose significant risks to human health and the environment, we are evaluating the risks from management of such items as scrap tires and used oil. Tires are difficult to landfill. Whole tires do not compact well, they take up a disproportionate amount of space in landfills, and they tend to work their way up through the landfill to the top, where they disrupt the clay caps that modern landfills employ to prevent water infiltration and minimize leachate generation. When shredded, tires take up 75% less space, but tire shredding equipment is expensive. As a consequence, most tires are discarded whole.

Tire stockpiles have sprung up all over the country. It is estimated that between 2 and 3 billion tires are currently stockpiled in the U.S., with at least one pile containing over 30 million tires. These piles are an aesthetic concern as well as a threat to public health and safety. Whole tires in piles collect rainwater and breed mosquitoes that can carry diseases. Tire piles are also known to be a significant fire hazard, often burning for several months because of the difficulty in extinguishing them (the 75% void space in a whole tire makes it difficult to either quench the fire or deplete the oxygen supply). EPA has been notified of 87 tire pile fires in 1989, 65 in 1988, and 46 in 1987; this represents almost a doubling of the number of fires in two years. Burning tires emit benzene and other toxic constituents, which contribute to poor air quality and produce oils, soot and other materials, which, when combined with the water from fighting the fire, can contaminate both surface and groundwater supplies. We are reviewing a number of studies focusing on particular elements of the problem, and will share such information with you as it becomes available.

The risks associated with used oil when mixed with hazardous waste are arguably more significant. Used oil that has been contaminated may contain elevated levels of heavy metals such as lead and cadmium, and sometimes may be contaminated with chlorinated solvents and PCB's. There is the further problem of used oil that is improperly disposed of by people engaging in "do-it-yourself" oil changes.

EPA has already responded to some of the risks associated with used oil. For example, EPA prohibits the burning of used oil with contaminants exceeding a certain level, referred to as off-spec oil, in non-industrial boilers. Individuals who market or burn off-spec oil must notify EPA, so that we can insure that it is not going to non-industrial users where it may pose an unacceptable health risk.

EPA is currently addressing a wide variety of used oil issues. These include:

- determining whether used oil should be listed as hazardous waste;
- developing management standards for used oil handlers;
- reviewing waste oil burning regulations; and
- exploring approaches to encourage the proper recycling of more used oil.

Final decisions have not been made in any of these areas.

Integrated Management of Municipal Solid Waste and Current Waste Generation

In February 1989, EPA published a national strategy for the management of municipal solid waste entitled The Solid Waste Dilemma: An Agenda for Action. The Agenda's comprehensive strategy relies on integrated solid waste management and the active involvement of Federal, state, and local governments, industry, and individuals to solve waste problems. Source reduction, recycling, combustion, and landfilling are all components of an integrated waste management approach. To promote a strong preference for source reduction and recycling, the Agenda sets a national goal to reduce the amount of municipal waste destined for disposal by 25 percent by 1992.

By the end of this year, we will issue final regulations for air emissions from municipal waste combustors. This fall, we will issue final standards for the location, design, operation, and closure of municipal solid waste landfills in keeping with the statutory mandate included in the Hazardous and Solid Waste Amendments of 1984. We anticipate that these requirements will lead to the closure of some older facilities and increase costs at the remaining facilities as they upgrade to meet these new standards. In addition, many landfills are reaching the end of their design life. The combination of these factors will encourage alternatives to land disposal, such as recycling, and raise further interest in waste-to-energy programs.

It is no secret that municipal waste generation in the U.S. has grown significantly over the years. In 1960, the nation produced 87 million tons per year of solid waste. By 1988, that total had grown to 175 million tons. The average American now throws away about four pounds of garbage per day. This is an all-time high in waste generation for the U.S., and is twice the per capita level of generation of West Germany and three times that of Italy.

In the U.S., about three-fourths of municipal solid waste is disposed of in landfills. Since the rate of creation of new landfills is slowing relative to retirements, there is a growing gap between generation and management capacity. Tipping fees at landfills, one indicator of capacity supply, are currently highest in the Northeast and Northwest, and are still relatively low in the South and middle West. The disposal of scrap tires, newsprint, and even used oil has a small but significant impact on landfill operation and capacity.

Approximately 234 million tires are discarded annually in the United States, almost one tire for every man, woman, and child in America. Over 82 percent are landfilled, stockpiled, exported or illegally dumped (scrap tires account for less than two percent of the volume of wastes disposed of in landfills); less than 14 percent of the scrapped tires are currently being recycled into new products or converted to energy.

Currently, paper and paperboard represent 41% of the municipal solid waste (MSW) stream. The 13 million tons of newsprint generated annually (9 million tons of which is incinerated or landfilled), accounts for 8% of the total MSW generated in the U.S. Approximately 1/3 of old newspapers (ONP) disposed in the U.S. are recovered for reuse either for newsprint, paperboard, other types of paper, or for export. Thus, about 5% of the actual quantity of material disposed of is old newspapers.

In 1988, 2.6 billion gallons of lubricating oil were sold in this country. This resulted in the generation of 1.4 billion gallons of used oil, of which 0.8 billion gallons entered the used oil management system. Used oil that does not enter the used oil management system is used on-site, dumped, or disposed, and we can expect that some of that used oil is finding its way into landfills.

An example of a significant federal response to the capacity shortfall is the development of federal procurement guidelines to expand federal purchases of recycled materials. These procurement guidelines cover five categories:

1) Cement and concrete containing fly ash;
2) Paper and paper products;
3) Lubricating oils;
4) Re-tread tires; and
5) Building installation products.

EPA is considering whether it would be useful to go beyond federal procurement guidelines in order to strengthen markets for certain recycled or reusable commodities. Two questions must be addressed before undertaking such an approach. The first is whether there is a significant long-term market failure for a given commodity, rather than a temporary shortfall between supply and demand, taking into account the fact that markets are dynamic and are rarely in perfect equilibrium. The second question is the significance of barriers to the development of such markets, such as obstacles to siting recycling facilities. We are currently studying aspects of the existing and potential markets for newspaper and scrap tires, and expect to complete our analysis in 1991.

STANDARDS FOR FEDERAL ACTION

If after careful study we conclude that an expanded role for the Federal government is appropriate, we would endeavor to design a program to be as efficient as possible, to allow maximum flexibility for affected parties to find "least-cost" methods of compliance. For example, marketable permits, credit systems, or other market devices could reduce costs by allowing the market to sort out where compliance investments can most effectively be made. This can be demonstrated by the example of the emissions trading program in the President's acid rain proposal, which is expected to save in excess of an estimated 20%, or $1 billion. It is also important to assure that economic incentives such as marketable credit systems do not inadvertently favor lower cost, higher risk forms of waste management.

Waste-to-energy plants make important contributions to preserving waste disposal capacity and displacing energy from fossil fuel. Since tires have a Btu value comparable to the best coal (about 12,000 to 16,000 Btu per pound), they would be expected to be an economically attractive fuel in some situations. Recent U.S. experience has demonstrated the economic feasibility of tire-to-energy power plants and for tire-derived fuel (TDF) used in cement kilns and pulp and paper mills.

While recognizing that selection of the best management option will depend on a full life cycle analysis, RCRA and EPA's policy establishes a presumptive preference that, all things being equal, favors reuse and recycling over combustion, as noted earlier. We are concerned that providing economic credits for the burning of newspapers for energy recovery might hamper efforts to build strong markets for the recycling of old newsprint into other paper products. As the Wirth bill notes, recycling of newsprint results in substantial energy savings relative to production of newsprint from virgin materials. These efforts have also begun to pay off, as paper manufacturers are expanding capacity for the recycling of old newsprint. Additionally, American newspaper publishers have made a commitment to buy all quality recycled newsprint available for sale in this country. EPA is currently attempting to determine the appropriate balance between the recycling and combustion of newspapers and other wastes in a draft proposed rule for municipal combustors.

At a minimum, the air emissions from the combustion of waste materials, especially used oil, should be carefully monitored and controlled prior to qualifying for aconomic incentive credits; we do not want to "solve" the solid waste capacity problem by encouraging the combustion of materials that could result in higher risks to human health and the environment. For example, most of the used oil entering the used oil management system is burned as fuel; unless it is subject to proper controls, burning may release heavy metals and PCB's to the environment as inhalable particles. The environmental implications of other disposal strategies need to be considered in developing policies in this area.

CONCLUSION

In conclusion, our threshold issue is whether or to what extent the disposal of rubber tires, newsprint, or used oil pose significant risks to human health or the environment. Additionally, we ask whether there are market failures that require the federal government to play a role in building demand for recyclable materials beyond existing procurement efforts. If the answer to either of these questions is yes then we believe the system should be designed to work as efficiently as possible through, for example, the use of marketable permits or credit systems. Further, we believe that any system needs to assure that incentive systems do not inadvertently favor recycling practices that may pose higher risks to human health or the environment.

One concern is how to fill the gap between generation of the waste and disposal capacity for the waste. In general, after the primary preference of source reduction, EPA's hierarchy of waste management practices favors recycling into higher uses, such as reclamation into industrial feedstocks or finished products over waste to energy. We agree with the Department of Energy, however, that waste-to-energy facilities can play an important role in alleviating capacity problems, and that life cycle costs should be taken into account to determine the appropriate balance between recycling and energy recovery from specific materials. We expect to continue our analysis of these life cycle costs, and the role of economic incentives in preserving capacity and reducing health and environment risks from the disposal of used oil, newspapers, and tires. At this time, therefore, we are not prepared to support a specific proposal for addressing these items.

We note that Senator Wirth's bill is designed to be administered by the Department of Energy, and that EPA has many authorities in the areas touched on by the bill. Because a number of EPA activities would directly affect the program proposed in the bill, we will want to consider the appropriate role EPA should play in any legislative solution to the problems we have discussed.

Senator **Wirth**. Dr. Morgenstern, thank you very much. You slid in under the wire in impressive fashion. This is the U.S. Senate, you know. That does not happen.

Dr. **Morgenstern**. Well, miracles occasionally happen, Senator.

Senator **Wirth**. Mr. Bernard.

STATEMENT OF DOUGLAS BERNARD, CHIEF, DEMONSTRATION PROJECTS DIVISION, OFFICE OF HIGHWAY OPERATIONS, FEDERAL HIGHWAY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION

Mr. **Bernard**. Thank you for providing the opportunity for the Federal Highway Administration to testify before your committee. My testimony is going to be on the subject of scrap tires.

The Federal Highway Administration has been involved with the use of rubber from scrap tires since the early 1970's. In 1976 we initiated a technology transfer demonstration project which resulted in the construction of 40 projects which use asphalt-rubber binder in a pavement surface treatment.

In 1983 we initiated an experimental project which is still evaluating the field performance of projects using asphalt, rubber and rubber-modified hot mix asphalt mixtures.

We have co-sponsored three national seminars on asphalt-rubber which provide a form for industry, academic, and news agencies to share this technology.

Presently we have a full-time engineer in our pavement design and rehabilitation branch examining and monitoring the performance of asphalt mixes with crumb rubber. Crumb rubber additive is our generic term for the rubber from scrap tires which can be used in the asphalt products.

Crumb rubber additive is a product from the ambient grinding of waste tires and from retread buff and waste. Adding crumb rubber to asphalt paving products can be divided into two basic processes commonly described as the wet process and the dry process. The wet process blends crumb rubber with the liquid hot asphalt cement. The dry process mixes crumb rubber with the hot aggregate in the hot mix asphalt facility prior to adding the hot liquid asphalt cement.

There are four general categories of asphalt paving products which use crumb rubber. Two applications, sealants for pavement cracks and surface treatments, both use the wet process and are well documented and used in several areas of the country today. Hot mixed asphalt mixtures with hot asphalt-rubber binder, the wet process, and rubber modified hot mix asphalt mixtures, the dry process, are more recent applications of crumb rubber technology.

Although the technology exists today to incorporate the rubber from scrap tires into asphalt paving products, there are two long-term issues which should be addressed before these products, particularly the hot mix asphalt mixtures, can be considered technological advances.

Issue 1. From the Federal Highway perspective we must evaluate the field performance of the various mixtures to determine if they are cost effective to the highway community. There is very limited comparable data on the performance of hot mix asphalt mixtures using crumb rubber. There is an increased cost associated with using crumb rubber over conventional asphalt products.

In general, paving products with crumb rubber presently costs 50 to 100 percent more than conventional asphalt products. If the performance does not outweigh the additional cost, there is no economical benefit to the highway community.

Issue 2. The recycling of hot mix asphalt mixtures has become a significant portion of the paving program in many States. The ability to recycle mixes which have crumb rubber has never been evaluated and documented. Field experimentation is needed to determine if the recycling process is environmentally acceptable and if the recycled material can produce an acceptable mix.

In conclusion, the paving industry presently consumes the rubber from 1 million to 2 million scrap tires each year in the form of crumb rubber. If these products can demonstrate cost effective performance, then crumb rubber could become a significant alternative use for waste tires.

We in the Federal Highway Administration plan to continue to monitor the performance of crumb rubber projects, establish its cost effectiveness and encourage States to experiment in recycling. We are presently developing our 1992–1996 research and technology program. It includes enhancing the application of waste materials for use in the highway construction business.

Thank you for the opportunity to express the Federal Highway Administration's position on the use of scrap tires in asphalt paving.

[The prepared statement of Mr. Bernard follows:]

STATEMENT OF DOUGLAS BERNARD

CHIEF, DEMONSTRATION PROJECTS DIVISION
OFFICE OF HIGHWAY OPERATIONS

FEDERAL HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

HEARING BEFORE THE
SUBCOMMITTEE ON ENERGY REGULATION AND CONSERVATION
COMMITTEE ON ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE

AUGUST 2, 1990

Mr. Chairman and Members of the Subcommittee:

Thank you for providing the Federal Highway Administration (FHWA) the opportunity to testify before your Subcommittee on the issue of scrap tires and their potential use as an additive for asphalt paving products. This issue has technical, economic, and environmental implications. Even though the technology exists to incorporate scrap tire rubber into asphalt paving products, there are still some long term effects from using this recycled product which have not been adequately addressed. This testimony provides an overview of the Federal Highway Administration's background on these matters, a summary of the state-of-the-practice, a discussion of our long term concerns, a picture of the present and projected costs, and our proposed future program in this area.

BACKGROUND

FHWA has been involved with the use of rubber from scrap tires since the early 1970's. In 1976, an FHWA Demonstration Project (Demo Project No. 37 "The Use of Discarded Tires in Highway Construction") resulted in the construction of 40 projects using asphalt-rubber binder in a pavement surface treatment. In 1983, FHWA initiated Experimental Project No. 3 "Asphalt Additives." Projects using asphalt-rubber and rubber modified hot mix asphalt mixtures are being evaluated. We have cosponsored three National Seminars on Asphalt-Rubber which provided industry, academia, and user agencies a forum to share this technology. Presently, we have a full time engineer in the Pavement Design and Rehabilitation Branch examining and monitoring the performance of asphalt mixes with crumb rubber.

STATE OF THE PRACTICE

"Crumb rubber additive" (CRA) is our generic term for the product from scrap tires which can be used in the asphalt products. It is the product from the ambient grinding of waste tires and from retread buffing waste. Tires can be ground by a cryogenic method, but the product is less suitable as CRA. The size (gradation) of the CRA is dependent on the process and application it will be used for. Typically, a fine ground CRA passes a No. 20 Sieve (0.04 inches) and is retained on a No. 50 Sieve (0.01 inches), similar to fine beach sand. A coarse ground CRA passes a No. 4 Sieve (0.19 inches) and is retained on a No. 20 Sieve (0.04 inches), like a coarse sand.

Adding CRA to asphalt paving products can be divided into two basic processes commonly described as the 'wet process' and the 'dry process.' The wet process blends CRA with hot asphalt cement and allows the rubber and asphalt to fully react in mixing tanks to produce an asphalt-rubber binder. This binder can contain as much as 30% CRA. Both the wet process and the products which use asphalt-rubber binder are protected by patents.

The dry process mixes CRA with the hot aggregate at the hot mix asphalt facility prior to adding the asphalt cement. Depending on the type of facility and the hot mix process, some degree of rubber/asphalt reaction takes place. This dry process produces a rubber modified hot mix asphalt mixture. These mixes can contain as much as 3% CRA by total weight of mix. "Plusride" is a patented product of the dry process, but the process itself, to the best of our knowledge, is in the public domain.

Laboratory test results show that adding CRA to asphalt paving products can improve the engineering characteristics of the asphalt binder. However, extrapolation of laboratory test results to field performance has not always provided reasonable correlations. The principle deterrent to using CRA has been cost. State and local agencies are reluctant to use paving materials which have a significantly higher cost and do not have equally higher field performance records.

There are four general categories of asphalt paving products which use CRA. They are crack/joint sealants, surface treatments, hot mix asphalt mixtures with asphalt-rubber binder, and rubber modified hot mix asphalt mixtures. Crack/joint sealant is an asphalt-rubber product, blending 15 to 30% CRA with the asphalt cement. This product is routinely used in many States as a maintenance material and is covered in the American Society for Testing and Materials specifications (ASTM D3406).

Surface treatments also use an asphalt-rubber binder with a similar amount of CRA. The binder is applied to the roadway surface at 0.6 gallons per square yard, then covered with aggregate and seated with a roller. This application of CRA began in the late 1960's and was patented under the trade names SAM and SAMI (Stress Absorbing Membrane and Stress Absorbing Membrane Interlayer). Under FHWA Demonstration Project No. 37, 40 SAM and SAMI projects were constructed and evaluated. This technology has been proven and documented, but the cost is higher than conventional asphalt surface treatments.

By the late 1970's the producers of asphalt-rubber binder began experimenting with the use of asphalt-rubber binder in hot mix asphalt mixtures. Again, the amount of CRA added to the asphalt cement is generally 15 to 30%. The research has shown that the amount of binder required in the mixes will increase over conventional asphalt mixes. Unfortunately, there have not been many controlled experimental projects of this material to evaluate its performance in comparison to conventional hot mix asphalt mixes.

The remaining category of asphalt paving products are the rubber modified hot mix asphalt mixtures. These products use the dry process to add 1 to 3% CRA to the total mix. This technology was developed in Sweden and introduced in the United States in the

1970's as the patented product, Plusride. FHWA Experimental Project No. 3 is evaluating projects constructed with this product. To date, the evaluations have observed both successes and failures. Examination of the dry process, outside of the patented Plusride technology, have just begun in several states. A number of years will be required to evaluate the performance of these new mixes before any performance history can be determined.

RESEARCH

Although the technology exists today to incorporate the rubber from scrap tires into asphalt paving products, there are two long term engineering issues which must be addressed before these products, particularly the hot mix asphalt products, can be considered technological advances. If the highway agencies were directed to use CRA today, and the products using CRA failed to satisfy these long term issues, we could be creating a problem many times greater than the problems we are trying to resolve.

The main engineering issue is cost effectiveness. From the FHWA perspective, we must evaluate the field performance of the various mixes to determine if they are cost effective to the highway community. Acceptance and use of these products by the State highway agencies will depend greatly on the life cycle cost. Any increase in product cost must be offset by an equal or greater increase in pavement performance. There is very limited comparable data on the performance of hot mix asphalt mixtures using CRA. If the performance does not outweigh the additional cost, there is no economical benefit to the highway community.

The other issue is recycling. The recycling of hot mix asphalt mixes has become a significant portion of the paving program in many states. The ability to recycle mixes which have CRA has never been evaluated and documented. If pavements with this additive cannot be recycled, we will have to deal with the disposal of these pavements. Even if we can successfully recycle the mix, we must also consider what effects the recycling process will have on the properties of the mix. Field experimentation is needed to determine if the recycling process is environmentally acceptable and if the recycled material can produce an acceptable mix. Examining this issue will require a combined effort of the highway community.

Although there have been no reported problems with the emissions from processing asphalt paving products with CRA, only a limited amount of research has been performed by the industry. We feel that additional testing, evaluation, and documentation is warranted.

MATERIAL COST

There is an increased cost associated with using CRA over conventional asphalt products. Surface treatments with asphalt-rubber binder have only been shown to be cost comparable to other pavement rehabilitation techniques in certain situations. However, there is limited performance history on the use of CRA in hot mix asphalt mixtures. After the long term performance data is collected, the life cycle cost of these mixes can be better established. The use of CRA in asphalt pavements may prove to be cost effective once patent barriers are addressed and the long term performance evaluations are completed. In general, paving products with CRA presently cost 50 to 100% more than conventional asphalt products.

CONCLUSIONS

The use of crumb rubber additive (CRA) in asphalt paving products has the potential to enhance the pavement and to reduce the volume of scrap tires. However, we must address long term issues before the products will be acceptable to the user agencies. The present high cost of using CRA is due to a limited market. FHWA's preliminary projections indicate that the full production cost for asphalt-rubber and rubber modified mixes will be 20 to 30% higher than conventional asphalt mixes.

The paving industry presently consumes the rubber from one to two million scrap tires each year in the form of CRA. If these products can demonstrate cost effective performance, then CRA could become a significant alternative use for waste tires.

FHWA PROGRAM

FHWA continues to encourage the State highway agencies to evaluate asphalt additives, including CRA. Our engineering staff is available to assist State and local agencies in the development of asphalt paving products with CRA. We plan to continue to monitor the performance of CRA projects to establish its cost effectiveness and we will encourage experiments in recycling. We are presently developing our "Research And Technology Program

1992- 1996." In the "Research and Development: Pavements and Structures Element" of this program, the "Materials to Strengthen and Enhance Performance Objective" includes enhancing the application of waste materials for use in highway construction.

Thank you for the opportunity to express the Federal Highway Administration's position on the use of scrap tires in asphalt paving. I would be pleased to address any questions you may have.

Senator WIRTH. Great, Mr. Bernard. Thank you very much.

I understand that your overall position, Mr. Detchon, is that we should rely primarily on technology that is moving very rapidly, and that is going to be the most important variable in dealing with these waste products. If I were to summarize the position of DOE, is that what your position is?

Mr. DETCHON. I think that technology, particularly in the areas of newsprint and tires, holds the promise of creating markets for the reuse of these products and therefore may obviate the need to have a more regulatory intrusion there.

Senator WIRTH. You would say it is technology versus a regulatory intrusion without reference to the fact that there can also be efforts to in fact create a market? That is a third option that we are talking about here.

I just noticed the contrast in your testimony. It is technology versus the heavy hand of Government and all of that good early 1980's rhetoric that I heard.

Mr. DETCHON. I agree that there is a middle path and that market incentives may in fact be appropriate, particularly, for example, for tires. I do not think that the approach outlined in the bill is the one that is the least intrusive. I think that Michael Boskin appropriately said that once you examine an individual product, there are choices to be made between price schemes, permit schemes, and mixed schemes that can provide market incentives, but I think that the approach in the bill is cumbersome.

Senator WIRTH. In other words, there is a third path, there is a market path that is not just technology, and that if the bill were adjusted per the kinds of guidance given to us this morning by Mr. Boskin, it might be an acceptable operation to DOE? Is that a fair conclusion from your testimony and your statement?

Mr. DETCHON. Yes. I think that you want in some way to provide a value to these substances. Now it may be that the technology developments will be sufficient to create a market force.

Senator WIRTH. That is the issue.

Mr. DETCHON. Or it may not be.

Senator WIRTH. That is the issue, whether we do it only through technology or is there another way to develop a market to provide value to these.

What we are suggesting, I think, is that while the technology is obviously changing and improving in some areas it may be more cost effective for us to move to a market at the same time. That is what we would like your response to, and I really did not get that.

I know you have to go through the OMB clearance process and so on. I understand that, but I would really like to submit some questions to you, if we might, and see if we could get you to hone down to look at those and where the tradeoff is between the technology and the market-based reactions.

Mr. DETCHON. I would not for a moment deny that market incentives in some places may be appropriate. I was talking more about the particulars of the bill and my objections.

Senator WIRTH. Had you said that it was only technology, I was going to come back and ask you why the administration was pushing so hard for depletion allowances, for example, on oil wells. If it was just technology, why not just encourage technology and forget the economic incentive of depletion.

Mr. DETCHON. I am glad that I did not answer it that way.

Senator WIRTH. I thought you were heading in that direction. I was just waiting. Sorry.

Dr. Morgenstern, I appreciate your discussions of the need for greater information on these. We all, I am sure, can use greater information, but what we would like to do, if we might, is to get EPA's reaction to these three pieces of legislation and how, in fact, meeting the goals that have been set out very clearly by Mr. Riley and by Mr. Boskin and by the administration over all that we want to look at the market.

Now maybe we need greater information in understanding the market and where those incentives are. I think at a time, for example, when we see API saying very positive things about oil recycling and the impact that that has, they clearly see that there is a market there. Where does that market trade off against potential environmental damages? That is what we would really like to hone down a little bit more, if we might get that from EPA.

I do not think we are going to do that here this morning; but again, we will have some questions for the record for you all to think about and perhaps answer for the record, if we might.

I do not know if you have any other comments you would like to make.

Dr. MORGENSTERN. I think the issue is how serious is the problem and how beneficial will the solutions be that might not otherwise take place in a market that was not aided and abetted by the Federal Government. I think that we are uncertain about that.

We have a number of studies under way, however, that we expect over the next year will actually add some significant information in that area.

We also are putting out a couple of regulations in the next year which we think will accelerate the pace of the movement away from disposal towards recycling and possible energy use.

I would be happy to answer any questions for the record.

Senator WIRTH. I think we are also in a climate in which there is a tremendous hunger out there among tens of millions maybe hundreds of millions of Americans for recycling. The economics of that are coming home very suddenly when you look at the cost of landfills. What do we do with landfills that are loaded with tires and newspapers, and is there some way that we can help the process of moving away from that extraordinarily costly solution to waste and do it also in an environmentally sound way.

I think that there is a confluence of factors going on here that we are trying to pick up and move rapidly. I know you all understand that and are sympathetic to that. The question is how far can we go to gain the approval of the OMB on this sort of front.

Dr. MORGENSTERN. I think, as I mentioned, we have a lot of enthusiasm for your market approach, and we just need to, as you say, hone it down a bit and see that it is applied——

Senator WIRTH. Let us do that. During the month of August we will have some questions down to you, and I would hope that we might then be able to refine this in response to the technology and market balance that you were talking about, which is exactly right.

I think that is exactly right. It did not come out in the testimony as clear, or maybe I did not understand it there. That is the balance that we are looking for; how far might we go and what else do we need to know in this area. That is very useful.

Gentlemen, we thank you very much.

Mr. Bernard, we really appreciate your being here. I think there are a lot of promising areas in this, as you point out, from the Department of Transportation. You all are doing some very innovative work, and we are going to hear more about that from other witnesses this morning. You are very good to come up and join us.

Gentlemen, we thank you very much. I know your gratitude for leaving at such an early hour shows on all of your faces. Thank you for being here.

We will have our next two witnesses join us. We are going to have a complicated morning of trying to fit everybody in with all of the action on the floor. I will ask for all of our witnesses' indulgence.

Our next panel is Dr. Randall Curlee from Oak Ridge National Laboratory, Energy Division, in Oak Ridge, Tennessee, and Mr. Robert Harvey from Nixon, Hargrave, Devans & Doyle in Rochester, New York.

Gentlemen, we thank you very much for being here. We greatly appreciate your willingness to come down this morning and participate in this. Both of you have had very extensive experience in looking at the realities and economics of recycling. We are very pleased to have such expertise here.

Dr. Curlee, perhaps we could start with you. Again, on behalf of the committee, I want to thank you very much for coming.

STATEMENT OF DR. RANDALL T. CURLEE, ECONOMIST, ENERGY DIVISION, OAK RIDGE NATIONAL LABORATORY, DEPARTMENT OF ENERGY

Dr. **Curlee**. Thank you, Mr. Chairman and members of the committee for the opportunity to speak on the proposed Energy Production and Conservation Act of 1990 and, more particularly, on the role of economic incentives in addressing waste management.

As an economist, I study the way markets work and, in particular, markets in waste management recycling. This morning I would like to present a simple economic framework to help explain why markets for waste management and recycling do not in all cases provide a system that minimizes total cost. I will also discuss general ways to minimize market imperfections and thereby improve the economic efficiency of markets to manage the types of waste included in the proposed legislation.

Much of economic theory is devoted to identifying market structures in which producers and consumers interact in a way such that the allocation of resources is most efficient or, in other words, products are produced and services are made at least cost. It can be shown that if markets work perfectly the private sector——

Senator **Wirth**. Dr. Curlee, if you could suspend for just a minute. I will be right back. Thank you.

[Pause.]

Dr. **Curlee**. Let me just continue here along the lines of the theory of economic efficiency and how markets work.

It can be shown that if markets work perfectly, the private sector management of solid waste by either landfill, incineration, recycling or source reduction will minimize total costs. Under these conceptually ideal conditions, no type of Government intervention could result in a more efficient system.

Unfortunately, the conditions under which this occurs are somewhat restrictive. If certain conditions are not met, our theory suggests that waste management will not be accomplished in the least costly way; that is, least costly when all types of costs are considered.

Three market imperfections are particularly relevant to waste management: imperfections with respect to external environmental costs; imperfections resulting from technical market and regulatory risks; and the imperfection that in most cases the price paid for disposal does not depend on the quantity or toxicity of waste discarded.

Briefly consider the implications of these market imperfections in general approaches to make the system work more efficiently.

An environmental externality exists when the production or use of a product results in environmental damage that is not borne by individuals or firms not involved in that product's manufacture or use. When this occurs, the price negotiated for that product will not take into consideration these external environmental costs; and, therefore, the product's price will be too low. Environmental damage will subsequently be higher than what exists if this market imperfection were not present.

Historically, command and control regulations have been used to place limits on environmental damages that may result in the production or use of a product; however, command and control is not administratively feasible when waste generators are numerous and widely dispersed, as is the case with household waste. The costs of compliance are excessively high.

Economic incentives are, in general, a more effective and efficient means of correcting the price of the product so that the product's price covers all costs inclusive of environmental damage.

The second type of market imperfection, imperfection resulting from excessive risk, is present to some extent in all markets. Under conceptually perfect market conditions, all producers and consumers must have perfect information about their markets or, in those cases where perfect information does not exist, all producers and consumers must be able to insure themselves against the risk resulting from the lack of information.

There are three general categories of risk: market, technological, and regulatory. When there is little information, when the information available is of poor quality, and when insurance cannot be purchased, a market imperfection exists.

In those cases where the potential social benefits are large, Government intervention is in general called for to correct the imperfection by promoting research and development, by facilitating the quality and flow of information, and by providing a stable, consistent and well-defined regulatory environment.

In those cases where market risks are particularly high, Government measures to promote market development may also be needed.

The third market imperfection results from the way waste disposal is priced in the United States. The typical household either pays a flat monthly fee for regular pickup services or has the cost of disposal paid out of local taxes. Neither method provides incentives for households to limit the quantity or toxicity of their waste or consider recycling as an alternative to disposal. Examples can also be given in which the cost paid by manufacturers for waste disposal are not related to toxicity.

Economic theory suggests that one way to solve this imperfection is to force consumers and manufacturers to pay for waste disposal according to quantity and toxicity of the waste they generate. Unfortunately, this potential solution has the side effect of encouraging households and industries to dump their waste. In addition, it is generally believed that the cost of administering a system based on both the quantity and toxicity of waste would be prohibitive.

There are, fortunately, other incentive mechanisms that avoid these problems. Credit systems such as those being considered today are administratively feasible and circumvent the incentive to dump waste. Such systems also have the benefit of encouraging the proper collection of waste which can vastly improve the technical and economic viability of recycling.

Arguments can be made that all three market imperfections I have just discussed apply to the waste materials considered in the proposed legislation. External environmental costs are not currently represented in the price of disposing used motor oil and scrap tires in particular and old newsprint to a lesser extent.

A strong argument can be made that the risk faced by firms contemplating recycling of these materials are currently large relative to other investments these firms might make. Further, the vast majority of households in this country do not pay for disposal of these items based on either quantity or toxicity.

Given that the potential social gains from improved management of these wastes appear to be large, Government has a role to play in reducing these market failures either directly or indirectly. Credit systems are one effective means of countering market failures. Credit systems internalize the cost of recycling such that producers and consumers pay a price more in line with true cost. In other words, the costs of recycling are borne by those who benefit from the product.

Credit systems also reduce the risks faced by firms contemplating recycling operations by defining which technological approaches are acceptable and by promoting the development of markets for recycled products.

To summarize, it can be argued that current markets for waste management suffer from market imperfections that cause the total cost of waste management to be higher than they would be in the absence of these imperfections. Government measures such as credit systems could, however, be put in place to partially correct these imperfections by providing economic incentives to manufacturers and consumers. By correcting or, at minimum, compensating for market imperfections, waste management can be made more environmentally sound and at the same time less costly.

Thank you. I would be pleased to answer questions.

STATEMENT OF ROBERT G. HARVEY, ESQ., NIXON, HARGRAVE, DEVANS & DOYLE

Mr. HARVEY. Thank you, Mr. Chairman and Members. I am honored to testify today on the use of economic incentives or, more generally, market approaches to address the problem of disposal of used oil, tires and newsprint and encouraging environmentally sound recycling of these materials.

Flexible cost effective market mechanisms have been used successfully in the past to address small or dispersed pollution sources, activities or products which are not readily amenable to control through traditional regulatory and enforcement action. Market-based approaches to mitigating environmental concerns must be used more widely in the future to manage our environmental problems.

I will summarize my written testimony by focusing on three points: first, the necessity for market-based incentives as an adjunct to the traditional regulatory actions to stimulate resource conservation; second, the value of the credit system; and third, the need to stimulate demand for the end products of recycling as well as the recycling activities themselves.

Market or incentive approaches are necessary to stimulate resource conservation not only because they save money, which they have been shown to do, or because they reduce resistance and compliance delays, all of which they can; but, rather, because without them I believe we cannot achieve the goals we seek.

The conservation of valuable resources contained in used oil, scrap tires, and old newspapers collides with the inherent limits of traditional regulatory programs and cannot be achieved by centralized commands alone. Some of these limits include:

First, the inadequate information about further feasible ways to control the thousands of diverse products and activities that contribute most to remaining pollution;

Second, limited Government resources to address these problems in a time of budget austerity;

Third, the soaring control costs for compliance with existing regulations which engender resistance. The smaller the perceived risk sought to be regulated, the higher the cost per unit of protection appears and the less people are willing to buy;

Fourth, slow Government response to new knowledge or rapidly changing circumstances through changes in regulations, often freezing past control technologies in place instead of stimulating new ones.

And last, few motives of the regulated entities to do or to disclosed more than the minimum required because the action of disclosure may make them targets for further regulations.

As prohibition has taught us, placing intrusive mandatory restrictions on ordinary citizens tends to erode the compact upon which social progress depends. In short, only by better matching individual interests with environmental goals—that is, by making it profitable—can we hope to achieve the desired level of resource conservation.

This bill recognizes that recycling is demand pulled, not supply driven. The credit provisions of this bill offer the opportunity to use market pull to direct recycling activities toward the highest or best use of the remaining resources in the used products.

The recycling credit system provides a flexible compliance with the bill's requirements, stimulating both new methods of recycling and new markets for the resulting products. It also stimulates development of new recycling facilities by creating the opportunity for recycling facilities to generate two revenue streams, the first from the product produced, the second from the sale of the credits to producers and importers.

This enhanced revenue stream can facilitate financing of new facilities and technologies. The sale of credits can also help to bring the prices for competing new and recycled products closer together. The cost of the new product will incorporate a portion of the costs incurred to recycle it, while the recycled product's cost may be reduced somewhat by the proceeds of the sale of resulting credits.

One note related to the adverse cost impacts of this bill, however. In some cases, facilities which burn or use solid waste may qualify for financing through issuance of tax exempt bonds in accordance with the Internal Revenue Code. Financial advantages are also available to these facilities under the Federal Power Act.

One of the natural results of this bill will be to create markets for certain of these materials which previously would have been considered solid waste qualifying for these financial benefits. The result would perhaps be the loss of the benefits. I suggest that the bill expressly grant these otherwise waste materials the status of solid waste to preserve these financial incentives. The impact on the Treasury will be negligible, if any.

The credit system should also be clarified to indicate whether a producer or importer can receive multiple credits for several steps of essentially a single recycling process, and there should be a reliable centralized data base established for tracking of the information on trading of credits to facilitate a market in them.

This bill addresses the process of recycling and recovery of resources, but we must focus on the products as well. Once the products have been removed through the recycling process, there must be a market, for we will only have succeeded in producing a more expensive waste for disposal.

Government procurement of goods made from recycled materials has often been cited, and correctly so, as one way to provide such a market. One alternative approach might be to require Government to procure defined products on the basis of comparisons of life cycle costs of the products made from virgin and recycled materials and not only upon the basis of current lowest price. Because of the volume of Government procurements, establishing policy through this mechanism will not only act as an example of putting policy into action but serve as a stable market which could enhance the opportunities to finance new facilities and technologies.

In conclusion, the market incentives are neither new nor radical. This bill offers an excellent opportunity to move from a static regulatory system to a dynamic one that continually generates needed reductions in pollution with significant conservations of energy and other resources contained in these otherwise discarded materials.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Harvey follows:]

Testimony of

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Rochester, NY, and Washington, DC

at the

HEARING ON ENERGY PRODUCTION THROUGH USE OF WASTE AND RECOVERABLE RESOURCES

before the

United States Senate
Committee on Energy and Natural Resources
Subcommittee on Energy Regulation and Conservation
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2d Session

INTRODUCTION

Mr. Chairman and Members, I am honored to testify today on the use of economic incentives, or more generally, market approaches, to address the problem of disposal of used lubricating oil, tires and newsprint and encouraging environmentally-sound recycling of these materials. My remarks concern the Energy Production and Conservation Act of 1990 (S.2923), the principal market-based vehicle before the Subcommittee today.

Flexible, cost-effective market mechanisms have been used successfully in the past to address small or dispersed pollution sources, activities or products which are not readily amenable to control through traditional regulatory and enforcement actions. Market-based approaches to mitigating environmental concerns must be used more widely in the future to manage environmental problems. Successful use of economic incentives to address recycling of used oils, tires and newsprint, which are now largely landfilled or disposed of improperly by tens of millions of consumers, can provide a model for broader application to the nation's environmental law framework in which economics reinforce environmentally-desirable behavior to encourage and increase recycling of used oil, tires, newsprint and other components of the waste stream, without case-by-case government intervention.

I should make clear that I am testifying today as an independent expert on use of economic incentives to address difficult environmental issues, not on behalf of any particular client, agency or constituent group.

My qualifications to speak in that capacity include over fourteen years' experience representing clients in all phases of waste management. My experience includes representing diverse industries in connection with their handling and disposal of both hazardous and non-hazardous process wastes, a municipal waste transporter, landfill operators and private developers and municipalities in the procurement, siting, construction and operation of municipal waste-energy recovery incinerators. I have also been involved in the development and financing of wastewater treatment facilities, recycling facilities, waste coal power production and wood gasification facilities and cogeneration facilities. I am a partner of Nixon, Hargrave, Devans & Doyle, a 250-attorney law firm with offices in Washington, D.C., New York City and throughout New York State.

This testimony was prepared with the assistance of my colleagues, Michael H. Levin and Scott Hoffman. Mr. Levin's qualifications include nine years' experience, beginning in the Carter Administration, as founding director of the Environmental Protection Agency's ("EPA") Regulatory Reform and Regulatory Innovations Staffs, where he was responsible for implementation of the air "bubble," emissions trading, and other incentive approaches that cut regulatory costs and expanded compliance options while maintaining or accelerating environmental progress. The idea of using a ticket or "credit" system to encourage used oil recycling, and answers to many early implementation questions, originated on those staffs during his tenure. His qualifications also include considerable experience over the last 18 months with environmental permitting and the risks of financing compost, waste-to-energy, infectious waste and other environmental facilities. He was actively involved in the Project 88 Report sponsored by Senators Wirth and Heinz. He chaired the Clean Air Working Group's Project 88 Task Force, which attempted to develop American industry's umbrella positions on use of market approaches under the Clean Air Act. Mr. Hoffman's qualifications include six years' experience in the development and financing of environmental facilities throughout the United States. These facilities include municipal solid waste incineration facilities, recycling facilities, waste coal power production facilities, waste tire power production facilities, landfill methane gas power production facilities, and medical waste disposal facilities.

Mr. Hoffman coordinates the Environmental Facilities Finance and Development Practice of the firm's Project Finance Group.

I want to focus on two key topics: why incentives are necessary and how I think the Energy Production and Conservation Act would work, with some specific suggestions for improving and strengthening that proposal.

WHY ECONOMIC INCENTIVES?: THE LIMITS OF TRADITIONAL REGULATION

Market or incentive approaches are necessary not only because they save money (which they've been shown to do in large amounts), or because they reduce resistance and compliance delays (all of which they can), but for environmental reasons. Without them, this country can no longer get where it wants to go. Like intractable smog, stratospheric ozone depletion, the solid waste crisis and greenhouse warming, the conservation of valuable resources contained in used oil, tires and newsprint collides with the inherent limits of traditional regulation and cannot be solved by centralized commands alone.

What are these limits?

- Poor agency information about further feasible ways to control the thousands of diverse products and activities that contribute most remaining pollution.

- Limited government resources to address these problems in an age of budget austerity.

- Soaring control costs which, according to EPA, already total over a half-trillion dollars for compliance with federal rules alone since the first Earth Day, and may now run as much as $150 billion per year, with no end to perceived crises or clean-up expenses in sight. Cost may or may not be a consideration; but compliance is. No company or country can do everything at once; the smaller the sources or risks we seek to regulate, the higher the costs per unit of protection, and the smaller the environmental returns. As with Oreos or VCRs, the higher the cost, the less people are willing to buy.

- Slow government responses to new knowledge or rapidly-changing circumstances through rules tailored to specific industrial processes or substances. Such rules require massive data, take years to complete, and often freeze past control techniques in place instead of stimulating new approaches.

- Few motives for regulated sources to do or disclose more than the minimum required, because such disclosure makes them targets for further regulation.

- New-generation problems caused either by small dispersed sources, products or activities or by large, generally well-controlled sources whose further control threatens sharply increased costs or regional conflicts.

Because many pollution problems of the 1990's involve significant contributions by "us" (small businesses and citizens), not merely "them" (corporate conglomerates), transcending these limits requires changes in lifestyles, behaviors and local or regional economies--results difficult to achieve with traditional regulations or enforcement. Moreover, as Prohibition taught, placing intrusive, mandatory restrictions on ordinary citizens tends to erode the compact on which social progress depends. Only a shift towards regulation plus incentives can deal with such problems by better matching individual interests with environmental goals. In short, we must also make it profitable for people and companies to reduce pollution, as well as to comply with regulations.

That shift has been underway for more than a decade now at EPA, which in response to diminishing returns of conventional regulation has implemented or seriously explored use of incentives in over a dozen air, water, pesticide and waste programs. It is worth noting that the EPA's air emissions trading policies are estimated to have saved the economy over $5 billion in conventional compliance costs from a relatively small number of transactions. According to reports by the General Accounting Office and the Conservation Foundation, those savings have been achieved with little or no adverse effects on air quality -- results likely to be enhanced by improvements, due to experience, in EPA's early trading rules.

EPA has steadily extended such approaches to new air pollution sources, to fleetwide and interfleet trades for tailpipe compliance by cars and trucks, to control of runoff from nonpoint sources, and to a variety of other circumstances. EPA's stratospheric ozone program relies entirely on market approaches. Most significant for this hearing, EPA's lead phasedown program cut lead in gasoline by 90% within four years, while saving smaller refiners about $200 million annually over the cost of refinery-by-refinery compliance, through a credit system similar to those proposed in the Energy Production and Conservation Act (S.2923).

After exhaustive analyses, both the General Accounting Office and the Conservation Foundation concluded that: such incentive approaches have saved up to 90% of the cost of conventional regulatory compliance, without compromising environmental quality; EPA has reasonably resolved such critical implementation issues as how to set fair "baselines" for measuring credit, how to avoid "paper trades" or phony reductions, and how to streamline procedures so these measures could be easily used; and such market approaches should be expanded, because their notable benefits (in terms of increased flexibility, incentives for innovation and easier enforcement, as well as more rapid, inexpensive compliance) were only a sample of things to come.

The Clean Air Act reauthorization bills approved by the Senate and the House and now in conference will accelerate this shift by legislatively endorsing nationwide market approaches for control of acid rain.

THE WIRTH BILL

The Energy Production and Conservation Act of 1990 builds directly on this experience by making producers and importers of oil, tires and newsprint part of the solution to the problem of environmentally sound disposal of the used products. Very briefly, the bill would do so by imposing on producers or importers a mandatory recycling quota -- based on each producer's previous year's output or imports, times a historical industry baseline for recycling -- that would escalate by a fixed percent each succeeding year for approximately 10 years. Thus, for example, an industry-wide scrap tire recycling rate of 25% in 1988 could result in quotas of 75% by the year 2000. These quotas could be met either by direct recycling into new tires or retreads, or by burning tires for energy, or by purchasing credits generated by other scrap tire recyclers.

The Bill recognizes the technical limits on recycling used oil, tires (especially stockpiled scrap tires) and newsprint, the safety and health problems which may arise from improper disposal of the used products, and, in the case of scrap tires, the danger that granting equal per tire credits for all "recycling" activities could worsen the problem by drawing tires away from preferred recycling operations. Instead, for scrap tires the Bill provides a ladder of credits: 1/4 credit for each tire shredded or burned for energy recovery after shredding; 1/2 credit for each whole tire burned in an approved manner; 3/4 credit for each tire reused or recycled after shredding; and 1 credit for each whole tire reused or recycled through, e.g., retreading, reclamation for use in new tires, or crumbing for use in rubber-asphalt highway paving. (It is not clear, however, whether these credits are cumulative; for example, does a producer or importer get one-fourth of a credit for shredding a tire plus one-fourth of a credit for burning the tire after shredding?) These credit provisions are designed to use "market pull" to reward early shredding and direct the flow of scrap tires towards their "highest and best use" (*i.e.*, that which is both most economically valuable and requires the least subsequent environmental management), while avoiding double-counting that could undercut the Bill's goals. And they are backed by complementary provisions meant to encourage prompt administrative action and cooperation by the regulated community (*e.g.*, the 60% "hammer" of § 338(a)(6)), to assure sound management of scrap tires from discard through end-use and to recognize the uniquely important role of the states in any successful program to address ubiquitous and widely-dispersed scrap tires.

The Bill recognizes that recycling is demand-pulled, not supply-driven. Like EPA's stratospheric ozone rules, it maximizes administrability and enforcement by applying recycling requirements to producers and importers, relying on the pull of positive prices to draw used products into the management system from those farther down the production/distribution chain -- and draw used products farther up that chain as the amount and value of available credits increase. The recycling credit system provides flexible compliance with the Bill's requirements, and stimulates both new methods of recycling and new markets for their results. Like the widely-hailed lead phasedown model, it creates a streamlined tracking system which both assures proper recycling and lets recycling credits be easily traded, based on normal business records.

Perhaps most important, the Bill allows recycling or reuse facilities to generate a double revenue stream from sale of both credits and intermediate or final products. Combined with the credit ladder, that approach can allow both easier financing (and therefore increased cost-competitiveness) of existing technologies for recycling or otherwise addressing used oil, scrap tires and old newsprint, and accelerated use of new technologies, such as nonproprietary rubber-asphalt highway cements or advanced crumb-rubber for used radial tires. (According to some, those two uses alone could absorb the roughly 240 million U.S. tires scrapped each year, returning this country to the pre-radial days of the 1970's when no scrap tire problem existed because virtually all scrapped tires were re-used.) The credit system may also help to bring the prices of new and recycled products closer together, stimulating a better market for the recycled goods. The cost of the new product will include part of the cost of recycling, while those recyclers who are able to sell credits can use the proceeds to reduce the prices of the recycled products.

SPECIFIC IMPLEMENTATION ISSUES

No bill or rule is perfect. Indeed, seeking perfection rather than reasonable progress is usually counterproductive in the environmental area, making the perfect the enemy of the good. S. 2923 constitutes a big step in the right direction. But I want to point out some implementation principles, drawn from experience with representing financial institutions, and with incentives under other environmental statutes, that could allow potential pitfalls to be easily fixed.1/

I am aware there are disputes over such questions as (a) whether producers and importers should be held directly responsible for disposal or reuse of the used products that are not now recycled into new products under current technologies or (b) what the level of credits should be, for example whether more than 1/2 credit per tire should be generated by such activities as whole-tire incineration for energy recovery. There are powerful arguments on both sides of such questions.

With respect to scrap tires, for example, some assert that because (unlike the situation with used oil or newsprint) only a small portion of these tires can be recycled directly into new passenger radials, S.2923 simply penalizes tire makers for this technological constraint. Others maintain that because of ease of implementation, the wide compliance choice open to producers and importers, and increased incentives for use of cost-competitive retreading as well as advanced technologies that could make higher proportions of scrap rubber available for new tire production, the Wirth Bill's approach strikes the preferable balance.

The selection of technologies and uses which will be accorded recycling credits and the levels of credits assigned to them will have a significant effect on the nature and level of recycling of scrap tires, used oil and newsprint. For example, some contend that granting one full credit per tire for incineration with energy recovery -- or at least such incineration in dedicated facilities -- would draw scrap tires away from retreading and other direct recycling options, a result that could undermine the retread business, distort collection networks or secondary markets and cut off scrap tire supplies that might otherwise flow towards new recycling technologies. Others assert that incineration and its associated sorting/collection activities can provide a necessary base to support other recycling activities and protect them against market fluctuations, hence incineration deserves one full credit. These assertions emphasize: the energy value of scrap tires; the need for sensible transitions where high volumes of new and existing tires must be absorbed by secondary markets before new uses can expand sufficiently; and the fact that disposal of scrap remnants will still be necessary, even after advanced recycling has done its work.

It is not my place here to resolve such issues, most of which are fact-specific in any event. I note with respect to (a), however, that to the extent one goal of the Wirth Bill is to encourage new technologies or to promote markets for more recycled products that will allow more used oil, scrap tires and newsprint to be reused, placing primary responsibility on producers or importers appears appropriate. That may be particularly true in light of manufacturers' significant influence over the nature of the recycled product, collection and other re-use networks, which could be mobilized to good effect under this Bill. (For example, vigorous tire industry support of recyclable rubberized-asphalt highway surfacing, and of government procurement guidelines for its expanded use -- both of which would be encouraged by this Bill -- could make a substantial difference.) Moreover, any "penalty" aspects of the proposed credit system become debatable when it is realized that producers may comply through a wide range of options including inexpensive long-term contracts with particular recyclers, and that an effective market for credits should make cost-effective compliance choices rapidly available. The benefits in goodwill alone may justify that effort.[2/]

I also note that a transition regime of quantity- or time-limited additional credits may be appropriate to encourage dedicated facilities as a back-up and general system support, and to cover technological lag, during the credit system's early years -- if it can be demonstrated that such extra credits will encourage rather than discourage other forms of recycling. Proposals for one (rather than 1/4 or 1/2) credit per whole-tire burned where certain conditions to promote recycling are met may be one such approach. The Bill should also address whether a producer or importer may claim multiple credits where it undertakes several of the approved recycling activities.

More important, these types of issues underscore the importance of incorporating regulatory safety valves which can allow sensible mid-course corrections and help assure that the credit approach produces positive rather than perverse results. In that sense they raise second-order design questions, not objections to the concept itself. One such safety valve which has been suggested -- a detailed study of the credit system's likely economic effects -- is effectively contemplated by the Bill already, because EPA, I understand, has begun such a study. Another would make the study's results more effective by allowing the Administrator to adjust or expand available credits within defined limits (e.g., by no more than 1/4 credit per unit per use, or by setting a cap on total credits available) based on that study's results.

Further suggestions for improving the Bill's implementation follow.

- Coverage. Because they are not radials, medium and heavy truck tires are already recycled into retreads, at a rate that appears to require imports because domestic scrap cannot meet the demand. Questions remain about the number of times such scrap tires are recycled and what happens when casings no longer get retreaded. But the Bill's authors may want to consider focussing first on the core problem of passenger tires, without diluting the credit system through application to circumstances where it may not be needed. If that assumption proves erroneous, Congress -- or the Administrator, under an appropriately limited grant of authority -- could extend the system to truck tires later on.

- Timing. Some of the Bill's provisions may not fit together well. For example, the requirements to burn or recycle used oil begin at an indefinite date not later than 18 months after the Bill's enactment but the Secretary's implementing regulations are not required to be promulgated in advance. Further, the test procedures referred to in Section 383 of the Energy Policy and Conservation Act are to be developed "not less than" 15 months after the Bill's enactment; I suspect that this requirement should read "not later than" 15 months after the Bill's enactment.

- Procurement. This Bill addresses the process of recycling and recovering energy from used oil and newsprint and scrap tires; but once they have been recycled into another product, there must be a market for that product or the recycling effort has only added costs to the production process without significant environmental benefit. Stimulation of the market for recycled goods through government procurement has been an often-cited goal but has not been effectively implemented. An alternative approach might be to require government procurement of defined products of recycling of scrap tires and used oil and newsprint on a life-cycle cost basis if the

Secretary does not issue guidelines within two years, allowing subsequently-issued guidelines to supercede those requirements. This approach could save the government money if, for example, rubberized asphalt or other scrap products were shown to possess a longer, more maintenance-free useful life even though the initial cost exceeded the cost of another product. It would also complement the credit approach by expanding the market for recycled scrap products.

- Credit Life. The Bill does not limit the useful life of a credit in the hands of a producer or importer who has generated or purchased it. Avoiding any time limit is particularly important for resale of credits by producers and importers who may buy more than they need or increase their direct use of scrap more rapidly than their competitors. Such resale appears contemplated by the Bill. It should be explicitly authorized, because it encourages producers and importers to do more than required.

- Tire shredding. The Bill defines "tire derived fuel" and "shredded tire" in terms of chip size. This kind of micromanagement appears self-defeating. There seems no reason why shredding of chips to a slightly different size is not an appropriate recycling method, for example.

- High grade and other types of paper. While this Bill focuses on the reclamation of used newsprint, the same mechanics could be used effectively to stimulate the recycling of used high grade office paper, corrugated paper and other paper products.

- Financing. In light of the fact that approximately 240 million tires are generated annually and some 2 billion scrap tires already exist, factors affecting the financing of new facilities or technologies to absorb these tires should be carefully reflected in the legislation. In particular, factors affecting the ability of new tire (as well as newsprint or oil) recycling facilities or technologies to be financed on the basis of their own revenue streams (*i.e.*, project financed) should be considered. Those factors include:

- *PURPA interface*. The Public Utility Regulatory Policy Act of 1978 ("PURPA"), enacted in response to the energy crisis of the 1970's, encourages development of more efficient power production facilities and those utilizing alternate fuels. PURPA requires utilities to purchase the electricity produced by "qualifying facilities" at the utility's avoided cost, thereby creating a predictable long-term revenue stream enabling a developer to obtain project financing. "Waste" meets the fuel use requirements for "qualifying facilities" under PURPA, and scrap tires have in the past been treated as qualifying waste. To the extent that S.2923 might alter this equation by causing scrap tires, used oil or used newsprint to be treated as something other than "qualifying waste fuel" and cause present or planned facilities to lose their PURPA qualification -- a result that does not appear intended, because it would effectively eliminate credits for burning these wastes -- the Bill should provide that these waste scrap tires, used oil and used newsprint shall be treated as "waste" for purposes of PURPA. That would let the credit market work as intended, without discriminating against the energy value of these materials or tilting the playing field in other directions.

- *Tax exempt financing*. The Tax Code (Section 142(a)(6)) generally allows use of tax exempt bonds where a substantial portion of the proceeds will be used to provide solid waste disposal facilities. If potential shredders or other recyclers are to be encouraged to undertake these projects, and the environmental and health costs of not addressing the disposal problem are greater than the tax cost to the Treasury (which most indications confirm), subsection 338(b) of S.2923 should be broadened beyond covering only scrap tires to provide that scrap tires, used oil and used newsprint shall be considered "solid waste" for purpoes of Section 3(17(A)(i) of The Federal Power Act and Section 142(a)(6) of the Internal Revenue Code of 1986 recycling facilities which can generate credits also be treated as solid waste disposal facilities for purposes of tax-exempt financing under the Code. In the absence of such a provision, this Bill would likely result in these materials not qualifying as "solid waste" because active markets in these materials would be established.

- Be predictable. Because cash flow is critical to success and incentive approaches ask people to change their behavior based on money or investment decisions, baselines for credit and the procedures for generating it must be as clear and unambiguous as possible. The Bill needs a definition section which clearly defines such terms as "producer or importer" (including basestock), "lubricating oils" (including grease and hydraulic or transmission fluids), and "recycling". It also needs to address the "lag-time" issue -- what past year's production will be multiplied by the percent recycling requirement to determine producers' and importers' present obligations and the size of the current market, because the two cannot be simultaneous.

- Use functional definitions and criteria. Viewed broadly, the goal is not only conservation of valuable resources through recycling, but reducing the impact of disposal of used oil, tires and newsprint on the environment. Any approach which meets this test should be eligible for credits, subject to management standards sufficient to address the core environmental problem (not hypothetical cases that are unlikely to materialize). These considerations are particularly important to avoid precluding new, unforeseen recycling technologies, especially for commodities other than used oil.

- Strengthens enforcement and credit trading. As with lead phasedown, sales and purchases of credits should be promptly reported to a computerized system that automatically flags discrepancies. Data reported should include the sale price, so participants can make rational economic compliance decisions in a functioning market. One additional way to stimulate recycling is to impose fees based on any recycling shortfall and the current price of new product sales or credits. Those fees could then be used to purchase credits from recyclers, creating both a secondary market to smooth transactions and a safety valve if recycling capacity does not keep pace with demand.

S. 2923 represents a substantial and appropriately cautious improvement over the initial concept in earlier House bills dealing with recycling of used oil, in part because it no longer runs the dual risk of constraints on production of virgin oil or the government printing tickets to make up any shortfall. Instead it sets mandatory, progressive recycling requirements for substantial producers and importers of virgin products, based on their prior annual production, and allows these requirements to be met by any combination of self-recycling (e.g., direct rerefining), or credits generated by other recyclers or reprocessors. This Bill continues to recognize that recycling is demand-pulled, not supply-driven. Mandated recycling is counterproductive if markets for the recycled commodity are so thin, marginal or erratic that recyclables return to sewers, back lots or landfills.

Like EPA's stratospheric ozone rules, it maximizes administrability and enforcement by applying recycling requirements to a relatively small universe of producers and importers, relying on the pull of positive prices to draw used materials into the management system from those farther down the chain. Like the widely-hailed lead phasedown model, it creates a streamlined tracking system which both assures proper recycling and lets recycling credits be easily traded, based on normal business records.

FINANCING COMPLIANCE: CREATING A LEGAL FRAMEWORK THAT ADDRESSES FINANCING OF FACILITIES

A significant aspect of the Bill is the attention to financing recycling facilities. The nation's environmental policy has sometimes ignored this important feature. To ensure that environmental facilities are developed and continue to operate, laws and regulations must provide a reasonably predictable revenue stream to the operator to satisfy financial institutions that loans received to construct the facility will be repaid. These financing considerations are particularly important where a major goal is to expand capacity to serve an expanding market, as described in the attached article on medical waste disposal.

For example, when Congress responded to the energy crisis of the 1970's, it understood that new power production facilities could not be developed without financing. The Congressional response was the Public Utility Regulatory Policy Act of 1978 ("PURPA"). PURPA requires utilities to purchase the electricity produced by certain "qualifying facilities" at the utility's avoided cost. Because of this Congressional requirement, developers of power facilities can apply for construction loans based on a predictable, Congressionally-mandated, revenue stream. Thus, money received from the utility that is required to buy the electricity serves as collateral for the loan. The success of new power facility development because PURPA's adoption is well-documented.

Similarly, S.2923 would increase operators' ability to finance and operate used oil and newsprint and scrap tire recycling facilities. Under the Bill, operators could generate a double revenue stream, from sale of credits as well as recycled product. This revenue stream, although not as predictable as the PURPA framework, nonetheless provides a level of predictability that will help ensure that the recycling project will support debt service.

CONCLUSIONS

Market incentive approaches are neither new nor radical. Environmental statutes have long relied on negative incentives to push people towards compliance; the Wirth Bill would merely add positive incentives to pull them there as well. Moreover, there is a large body of implementation experience, at EPA, in Europe and elsewhere, on which Congress can draw to assure that flexibility is accompanied by continued environmental progress. While it raises some implementation issues, S.2923 goes in the right direction. It represents one good chance to move from a static regulatory system to a dynamic one that continually generates needed reductions in pollution and risk from within.

1/ In reviewing the Bill I noted a number of cross-references, internal inconsistencies in terms used and references to concepts which were not incorporated into the version of the Bill which I reviewed. For example, the term "reclaimer" does not include a tire-derived fueled facility. One method for complying with newsprint recycling requirements is to "purchase de-inked old newspapers for purposes of combining with shipments [sic] of virgin newsprint [sic]" (Paragraph 338(a)(2)(D)); the authors were probably referring to the combination of pulp from de-inked old newspapers with virgin pulp. While not significant to my testimony here, I would be pleased to provide additional editorial comments on this Bill.

2/ Some assert that the U.S. only has a scrap tire problem because makers shifted to synthetic radials in the early 1970's and then created demand for that new product. In light of increasingly stringent state regulation, it may be only a matter of time before states follow the Superfund and CFC models by placing preventive and remedial responsibility on what they will view as the source of the problem. In short, the Torres Bill does not write on a clean slate; it offers the industry a proactive chance to get ahead of the curve through means that afford maximal compliance flexibility, before less desirable results follow.

Senator **Wirth**. Great. Mr. Harvey and Dr. Curlee, thank you very much. The committee's appropriation bill is on the floor right now. That is why there are a lot of things going back and forth here. We have a vote to which I have to go.

I have three questions which I wanted to ask you. If you can stay for about 15 minutes, I will be back, and then we can get into those. Would that be all right? Sorry about the interruption, but that is part of the process, as you know.

So if you could hang on for 15 minutes, I will be right back. Thank you.

[Recess.]

Senator **Wirth**. The subcommittee will come back to order. I really appreciate our witnesses' patience. We just finished the energy and water appropriations bill on the floor and should have some clear sailing for a little while.

If I might ask, Dr. Curlee, you heard the administration panel before. You were here for that panel; right? You heard that incentives may be too intrusive for the market. Do you agree that without incentives the reuse of scrap tires, used oil and old newspapers cannot be sustained under existing or reasonably foreseeable market conditions?

Dr. **Curlee**. I would think so. I think the market failures with respect to those waste streams are quite large, and unless we do something to encourage market development and reduce risk, we are not going to make significant progress. I think a lot of the risk is coming from the lack of direction at Congressional level. I think there has to be some coming together of minds as to what the appropriate approach should be. If you are a potential recycler, the risks, particularly the regulatory risks, are very large, and it is hindering people getting into the business.

Senator **Wirth**. Do you have any comment on that, Mr. Harvey?

Mr. **Harvey**. I would agree with that. I think that history shows that it is satisfactory. We are not doing as much as we need; therefore, we need to provide some incentive to improve the recycling rates that we now have.

Senator **Wirth**. If we assume that incentives are needed and somehow we have to help to make that kind of a market, what is your reaction, Dr. Curlee, to using credits as opposed to other mechanisms? For example, we could use the tax legislation and provide incentives in that direction.

Dr. **Curlee**. The tax legislation would be a less intrusive way, I would suppose, to approach this problem. I think history has suggested those incentives do not work particularly well. I think that the tax incentives have to be so large that it is difficult to get that approved. I think the credit system has some benefits in terms of internalizing this cost of recycling.

The real question is should we recycle and to what extent. If we decide that in fact the environmental problems are such that we should recycle, the credit system is a very effective, very efficient way to go about doing that. You simply set up a market for credits. We do that kind of thing all the time. I cannot imagine that the credit market would be overly complicated.

Senator **Wirth**. It seems to me we do intervene in the so-called free market on a steady basis. We do it all the time; therefore, we want to find the most efficient way of doing that to accomplish the goal you want to set up, which in this case is also to look at the value of recycling, the value of having less waste going into landfills and so on and the resultant environmental problems.

Dr. CURLEE. I think the market failures that I laid out all apply to the waste that you are talking about. If in fact those market failures are severe enough, that is more of a technical question than an economic question. If they are severe enough, then certainly there is a role for Government to play.

There are very different ways of going about doing that, and for different markets it may mean that one way is more appropriate than another. In the case of motor oil and tires, I think it is a very efficient way of promoting a certain level of recycling.

Senator WIRTH. Why have we not done this before?

Dr. CURLEE. Why have we not?

Senator WIRTH. Why have we not done it before?

Dr. CURLEE. That is a good question. I think it is very difficult to encourage manufacturers to accept this responsibility. I think there is a feeling that the cost of such a program would be borne by the manufacturers when, in fact, I think it is going to be borne by the manufacturer and the consumer. That is the way it should be. The manufacturer and the consumer should pay for the cost of recycling. It should be internalized in the cost of the product. In fact, the credit system will do that.

In order to produce, you will have to buy a certain number of credits. The market will set the price of those credits. It will be paid by the manufacturers and, depending upon the market structure of the industries producing these products, a certain amount of it will be passed on to the consumers.

So the people who benefit directly from the production and use of these products will be paying for the recycling of those products, and that within an economic framework is exactly what you want to happen.

The only question is how much recycling do we need, what types of recycling do we need, and if those questions are answered satisfactorily the credit system is an extremely efficient way of getting at that goal.

Senator WIRTH. Mr. Harvey, can you explain to us this morning why it would be helpful to specify that these materials which would otherwise be discarded should be specifically designated as solid waste? You suggested that in your testimony, and I would like you to expand a little bit on that.

Mr. HARVEY. The reason for that is simple. The financial incentives provided by PURPA to generators of energy using biomass waste material are very significant. The ability to finance solid waste management facilities through the use of tax-exempt bonds is also significant. Each of those depends upon dealing with a solid waste material.

This bill would have the laudatory effect of developing a market for the waste material. On the other hand, it would conversely take that material out of the category of waste. For example, the regulations under section 142(a)(6) of the Internal Revenue Code say that if any person will pay any price for a material, it is not a solid waste and, therefore, a facility which was managing that material would not be qualified to receive tax-exempt bonds under section 142.

So we have a conflict there between the benefits of those financial incentives and producing a markup.

Senator WIRTH. Can you give us language, or maybe you have done so, as to what modification to the legislation would cover the problem that you have described?

Mr. HARVEY. I have in my written testimony given you language that suggests that we state specifically that materials which would otherwise be considered solid waste but for the sale of the materials as a result of these markets remain solid waste for purposes of the Federal Power Act and section 142 of the code.

Senator WIRTH. One final question if I might, Mr. Harvey. Can you speculate on enforcement mechanisms?

Mr. HARVEY. As I look at the bill now, there are no provisions which compel compliance with the credit system, so that if a producer or an importer were to fail to meet its quota it does not appear from the bill that there would be any penalties imposed. Hence, if it were a more expensive process, one could theorize that the importer or producer would not comply.

So it seems to me there needs to be, in addition to the positive incentive, some disincentive for failing to meet the quota for recycling or purchasing of credits.

Senator WIRTH. Do you have some ideas as to what that might be?

Mr. HARVEY. One could speculate you could have a fee, for example, tied to the cost or the market value of the credit so that failing to meet that particular quota would result in a financial cost to the producer or importer.

One might also speculate that tying the compliance or failure to comply with that quota to a Government procurement might also spur compliance.

Senator WIRTH. Both of those require a very significant recordkeeping operation. Is that a problem? That was referred to this morning by both the DOE and the EPA witnesses.

Mr. HARVEY. I suspect that there is certainly a cost associated with that. On the other hand, if there is truly a market for the credits, it would seem to me that there will have been developed a sufficient recordkeeping process to be able to reach that goal without posing a significant increase in the cost.

Senator WIRTH. Do either of you have any final comments you might like to make reflecting on what you heard this morning from the administration witnesses or based upon our exchange here?

Mr. HARVEY. I would like to simply note that I think the credit system has an additional virtue of bringing the cost to the consumer of recycled products more in line with those produced with virgin materials and, therefore, spurring a market for those materials.

Certainly, recycling is good, but the goal has to be to be able to use the materials and the products produced by recycling. In the absence of a market, we will simply be throwing away a more expensive waste material. It seems to me the credit and internalizing the cost of the recycling in the price of the new product will help to develop that market for the recycled goods.

Senator WIRTH. What is your reaction to the DOE statement this morning that the technology was advancing very rapidly and we could depend upon the technology to solve the problem of all of the materials in the waste cycle?

Mr. HARVEY. I have no comment on whether the technology is going to be adequate, but I think in response to simply point to history to say at this point we do not have sufficient recycling, we are disposing of a number of these goods with viable resources and we need to spur on the development of technology, providing credits in fact may help to finance the development of the technologies.

Senator WIRTH. Dr. Curlee.

Dr. CURLEE. I would say that the development of new technologies is certainly one of the approaches that the public sector uses to correct market failures. It is only one approach, and it only addresses certain types of market failures.

The market failures that we are talking about here, the predominant market failures, I do not think are most effectively dealt with, with the development of new technologies. It certainly has to be a part of it.

In the case of recycling these materials, we also face these significant risks in terms of a potential firm entering a recycling operation. That is a very risky undertaking right now because of the technological issues. That can be overcome with research and development, but it is also very risky because of the regulatory environment in which we currently operate, and it is also very risky because of the market uncertainties and risks that we face.

It is also the fact that we do not price waste disposal in the way that we should price it if in fact we want to use a market system. The fact is that we do not use a market system when it comes to disposing of waste. We do not price according to how much you produce or the toxicity of what you produce. That is a very fundamental market failure.

So to say that markets work is fine, but in order to say markets work you have to show that certain conditions are met. In the case of the waste that we are talking about today, those conditions simply are not met. That implies some need for Government involvement, either direct or indirect. There are many ways to do that. The credit system is one very effective way to do that and should be considered as one of the top methods of encouraging waste management. I think it has a lot of attractive features. It addresses most of the market failures that we currently see with respect to these waste streams.

Senator WIRTH. Well, gentlemen, I thank you very much. Again, I want to reflect my appreciation for your patience. We may have a couple more questions for the record following the discussion this morning.

Thank you very much for coming in, and your statements will, as I noted, be included in full in the record as well as our back-and-forth and questions for the record. Thank you so much.

If we might move to our next panel. We have four witnesses: the Honorable Sonny Bono, Mayor of Palm Springs, California; Mr. John Serumgard, Vice President of the Tire Division of the Rubber

Manufacturers Association in Washington; Dr. Gordon Marker, Executive Vice President of the Oxford Energy Company in Santa Rosa; and Mr. Michael Rouse, President of the Rouse Rubber Industries in Bicksburg, Mississippi.

Gentlemen, we appreciate your being here. Perhaps we could go in that order. I think you are all familiar with the rules of the committee. We will include your statements in full in the record. If we might, what we would like to do is have you observe the 5-minute time operation again. These closing days of the session are frantic. I am so appreciative of your being here.

Mr. Bono, perhaps we could start with you, go then to Mr. Serumgard, to Dr. Marker and to Mr. Rouse.

STATEMENT OF SONNY BONO, MAYOR, PALM SPRINGS, CA

Mr. BONO. Thank you, Mr. Chairman. Mr. Chairman and members of the committee, thank you for providing me with the opportunity to testify before your committee on my experience as Mayor of the City of Palm Springs and the benefits I have observed to our community from the commercial application of the recovery of scrap tires and their use in asphalt paving products.

I would like to compliment the committee for its efforts to conserve our valuable natural resources and enhance energy and efficiency efforts which will protect our environment through your consideration of the Energy Production Conservation Act of 1990.

This program recognizes market-based incentives targeted at energy recovery and conservation that can significantly reduce the proliferation of scrap tires.

Scrap tires are defined as any tire that is no longer usable for its original intended purpose, tires which for the most part are needlessly discarded into landfills, stockpiles or, worst of all, illegally dumped along the roadsides and open space areas of our Nation. Tires do not biodegrade or reduce in size. They just sit there every year, and the piles grow bigger and bigger.

Government statistics show there are more than 5 billion scrap tires strewn around the countryside. Approximately 279 million used tires are scrapped annually, and of these, only a small percentage are ever commercially recovered. If these tires were stacked one on top another, they would reach a height equivalent to 98,000 Empire State Buildings. These tires represent 1 percent of all the solid waste that is generated each year; yet, 85 percent of these scrap tires are wasted. Only 15 percent are utilized for any purpose.

We must reverse this trend, and we have the technology to do it. We can make a big impact on the percentage created by scrap tires.

Thirteen tires can occupy an entire cubic yard of landfill space, while the same space would hold about 700 pounds of newspapers. Seventy four percent of all the existing landfills will be forced to close by the year 2000, so we must find ways to conserve the remaining space.

Scrap tires constitute a health risk as well as a solid waste problem. Toxic fumes emitted from fires that burn uncontrolled at dump sites pose air pollution hazards. Tires filled with water from rain or runoff provide an ideal breeding ground for disease-carrying mosquitoes. The Environmental Protection Agency has analyzed the connection between stockpiled tires and disease and estimates the treatment cost of mosquito-borne diseases such as encephalitis and yellow fever exceeds $5 million annually.

The EPA estimates there were 176 major tire fires in the United States between 1971 and 1988. These fires are extremely hard to extinguish and often are allowed to burn themselves off with the result of air and groundwater pollution.

Your committee is charged with the oversight and legislative responsibility for Federal energy conservation programs. As Mayor, I am responsible for providing leadership to the citizens of Palm Springs and guiding our community through the maze of problems that confront a modern city. Part of the challenge facing all of us is how to deal with the question of solid waste disposal and how individual communities can do their part to help resolve that problem.

I am proud to say that Palm Springs is the leading municipality in the State of California in the utilization of the asphalt-rubber chip seal coat resurfacing process. The rubber chip seal coat is an established asphalt-rubber process consisting of 20 percent or more recycled rubber and 80 percent of paving grade asphalt. This process is in use in 35 States and 8 foreign countries and has been used by Caltrans for 10 years.

Palm Springs began using asphalt-rubber in 1983. To date, our city has recycled over 75,000 scrap tires. Only Caltrans has used more scrap tires than California. There is a map over there, and displayed on the map are the streets in our city that have been resurfaced with asphalt-rubber. Our city has resurfaced more than 26 miles of streets throughout our community.

There is supposed to be a following map, but it is not there. That would be a projection of what we intend to do in phase 2, which would be an additional 20 miles of road scheduled to be resurfaced in that phase.

As many as 16,000 scrap tires are utilized for each mile of resurfaced roadway. Asphalt-rubber technology is probably the most viable recycling option for used tires. It has superior engineering and environmental qualities and is extremely cost efficient.

Let me just say to the committee that we have been using this system. It is cost effective. It is terrific. One of the reasons we use it is that we were in an economic crunch when Proposition 13 came in, and we had to get creative in ways to save money in our community. So we researchwise came up with this, and, sure enough, it was far more economical, far more usable, far more effective in our city and definitely is a boon to our city. It is terrific.

[The prepared statement of Mr. Bono follows:]

TESTIMONY OF
THE HONORABLE SONNY BONO
MAYOR OF PALM SPRINGS, CALIFORNIA
HEARING ON LEGISLATION TO PROMOTE ENERGY EFFICIENCY THROUGH THE USE OF WASTE AND RECOVERABLE MATERIALS
BEFORE THE
SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES
SUBCOMMITTEE ON ENERGY REGULATION AND CONSERVATION

AUGUST 2, 1990

Mr. Chairman and Members of the Committee; thank you for providing me with the opportunity to testify before your Committee on my experience as Mayor of the City of Palm Springs, and the benefits I have observed to our community from the commercial application of the recovery of scrap tires and their use in asphalt paving products.

I would like to compliment the Committee for its efforts to conserve our valuable natural resources and enhance energy efficiency, which will protect our environment, through your consideration of the Energy Production and Conservation Act of 1990.

This program recognizes market-based incentives, targeted at energy recovery and conservation, that can significantly reduce the proliferation of scrap tires. Scrap tires are defined as any tire that is no longer usable for its original intended purpose. Tires which, for the most part, are needlessly discarded into landfills, stockpiles or, worst of all, illegally dumped along the roadsides and openspace areas of our nation. Tires that do not biodegrade or reduce in size, they just sit, and every year the pile grows bigger and bigger.

Government statistics show that there are more than 5 billion scrap tires strewn about the countryside. Approximately 279 million used tires are scrapped annually, and of these only a small percentage are ever commercially recovered. If these tires were stacked one on top of another they would reach a height equivalent to ninety-eight thousand (98,000) Empire State Buildings. These tires represent one percent (1%) of all the solid waste that is generated each year, and yet, eighty-five percent (85%) of these scrap tires are wasted, only fifteen percent (15%) are utilized for any purpose. We must reverse this trend and we have the technology to do it. While we cannot reduce one hundred percent (100%) of the solid waste problem, we can make a big impact on the percentage created by scrap tires. Thirteen tires can occupy an entire cubic yard of landfill space, while the same space would hold about seven hundred pounds (700 lbs) of newspapers. Since seventy-four percent (74%) of all existing landfills will be forced to close by the year 2000 we must find ways to conserve the remaining space.

Scrap tires constitute a health risk as well as a solid waste problem. Toxic fumes emitted from fires that burn uncontrolled at dumpsites pose air pollution hazards, and tires filled with water from rain or runoff provide an ideal breeding ground for disease carrying mosquitoes. The Environmental Protection Agency has analyzed the connection between stockpiled tires and disease and estimates that treatment costs of mosquito borne disease, such as encephalitis and yellow fever exceed five million dollars annually. The EPA estimates that there were one hundred and seventy-six (176) major tire fires in the United States between 1971 and 1988, about ten (10) each year. These fires are extremely hard to extinguish and are often allowed to burn themselves out, with resultant air, surface and groundwater pollution.

Your committee is charged with the oversight and legislative responsibility for Federal energy conservation programs. As mayor, I am resposible for providing leadership to the citizens of Palm Springs and guiding our community through the maze of problems that confront a modern city. Part of the challenge facing all of us is how to deal with the question of solid waste disposal, and how individual communities can do their part to help resolve that problem.

Palm Springs is the leading municipality in the state of California in the utilization of the Asphalt-Rubber chip seal coat resurfacing process. The rubber chip seal coat is an established Ashpalt-Rubber process consisting of twenty percent (20%) or more recycled rubber and eighty percent (80%) paving grade asphalt. The process was developed over twenty-five (25) years ago and is in use in thirty-five (35) states and eight (8) foreign countries. It has been used by Caltrans (California Department of Transportation) for over ten (10) years.

Palm Springs began using Asphalt-Rubber in 1983. To date, our city has recycled over seventy-five thousand (75,000) scrap tires. Only Caltrans has used more scrap tires in California, ninety-seven thousand, eight hundred and fifty-five (97,855) statewide. Palm Springs used more than double the amount of the City of Santa Clarita, which has a population three times as large as Palm Springs. Displayed on the map behind me are the streets in our city that have been resurfaced with Asphalt-Rubber. Our city has resurfaced more than twenty-six (26) miles of streets throughout our community during the last few years. The following map shows the streets that we plan to do as the second phase of this project. Approximately twenty (20) additional miles of roads are scheduled to be resurfaced during this phase.

As many as sixteen thousand (16,000) scrap tires are utilized for each mile of resurfaced roadway. Asphalt-rubber technology is probably the most viable recycling option for used tires. It has superior engineering and environmental qualities, and is extremely cost effective.

The Asphalt-Rubber process reduces expenses for street maintenance programs significantly. The longer life and reduced maintanence means long term savings. Resurfacing roads with Asphalt-Rubber chip seal can be accomplished at a quarter (1/4) of the cost of replacement with conventional asphalt, with comprable results. It will last longer and is resistant to aging and embrittlement due to the recycled rubber crumb material used in the mixture. It reduces public inconvenience and liability generally associated with street and highway repairs because of its fast application and ability to handle traffic immediately. It can reduce noise pollution more than fifty percent (50%), in fact a recent Arizona study, conducted by Western Technologies Inc., indicated that noise reduction could be as high as eighty-eight percent (88%). An added bonus is the reduced skidibility that is a by product of this process, which in turn may mean savings to the city in terms of less liability. Finally, it conserves a precious natural resource, oil, as less material is required. The average tire contains 2.5 gallons of oil and recycling tires is a way to cut down on our dependance on imported oil.

Unfortunately,.the recycling of scrap tires has been underutilized because of adverse economics. It is far cheaper to discard a tire than it is to recycle one. In 1941 thirty-two percent (32%) of the nations tires were reclaimed, in 1990 the figure has shrunk to five percent (5%). We must attempt to utilize our scrap tire resource in more productive ways. Retreading requires only thirty percent

(30%) of the energy needed to produce a new tire. Additionally, Ashpalt-Rubber roads can last two to three times longer than conventional asphalt surfaces. These two methods of scrap tire utilization are available to us today. We have the technology, what we need is to encourage our cities, counties and states, and, indeed, the federal government to utilize this method of scrap tire recovery. Ironically, recycling would create six times as many jobs as just throwing this resource away.

The Energy Production and Conservation Act of 1990 would encourage the private sector to utilize the existing technologies available for scrap tire recovery. By providing incentives to businesses, through the allotment of credits, recycling scrap tires can become more attractive economically. A credit is defined as a legal record of recycling activity that can be sold to a manufacturer to demonstrate compliance with the act.

We need to rethink how we approach the problem. It is clear that we can no longer continue to throw things away and not be concerned about the consequences. Our precious resources and fragile environment will not stand up under this onslaught forever.

We have the technology to make a difference and Palm Springs is using that technology to do its part. I hope that by the year 2000 Palm Springs will be able to say that it is a one hundred percent (100%) recycling community. We have made a start but there is much left to be done. I encourage every community in this country to consider recycling tires through the various technologies now available. Our children will inherit the legacy we leave, and I hope that we can leave behind an environment that is healthy and safe for generations to come.

Once again, I would like to thank the Chairman and the members of the Committee for the outstanding work you are doing on energy conservation. Our country is at an environmental crossroads and we all have the responsibility, individually and collectively, to be part of the solution. Our history has shown that when America is willing to work together, there is no challenge too great for us to overcome.

Senator WIRTH. Mr. Bono, thank you very much.
Mr. Serumgard.

STATEMENT OF JOHN SERUMGARD, VICE PRESIDENT, TIRE DIVISION, RUBBER MANUFACTURERS ASSOCIATION

Mr. SERUMGARD. Thank you, Mr. Chairman. I would like to comment just briefly on Mr. Bono's statement that asphalt-rubber is presently cost effective. We might indicate that that is in the absence of any market credit system that now exists. So there is a technology out there.

First of all, I am John Serumgard, the vice president, Tire Division for the Rubber Manufacturers. We include in our membership virtually all of the companies manufacturing tires in the United States.

The tire industry has long been involved in efforts to find economically sound and environmentally acceptable methods of scrap tire disposal, and we are prepared to work with all parties at local, State, Federal, and private sector levels to continue to develop and implement tire disposal and recycling options.

We believe that no one solution will solve the problem; however, we think that with the cooperation of everyone concerned these problems can be solved.

We come to you today with a concern that many of the issues involving scrap tire disposal and usage have not been addressed in this legislation. First, we believe that the beginning point of any legislative approach should address proper handling and disposal of scrap tires. We are concerned that after months of discussion with House and Senate staff, the drafters have omitted these management concepts from this legislative.

Second, the legislation fails to even recognize the success the tire industry has had to date in using approximately 30 percent of annually generated scrap tires in some responsible way. This level of recycling is far above other commodities in the waste stream with the possible exception of aluminum and steel and exceeds the goal outlined in RCRA by the administration of 25 percent recycling.

To add substance to our existing efforts, the tire industry has just established a new council, the Scrap Tire Management Council, which has the mission of assisting, developing and promoting the utilization of scrap tires as a valuable resource in an environmentally and economically sound manner.

Over the next 5 years, the council and its full-time staff will be devoted to reaching its strategic objective of increasing the environmentally sound utilization of scrap tires to more than 50 percent of annual scrap tire generation.

We approach this legislation today with the understanding that it is intended to begin a dialogue in an issue of major national importance and that it is the first proposal intended to stimulate discussion and consideration of alternative Federal approaches to this issue.

We share with the sponsors a strong desire to find environmentally sound and economically viable solutions to the problems presented by scrap tires and to consider the appropriate role of Federal legislation. We do not differ on the goal of sound scrap tire disposal. If we do differ on the specific approaches proposed on this or any other legislation, it is done out of a desire to find reasonable, effective solutions and to test any proposal to insure its soundness.

As we view this legislation, it would create a highly complex structure of definition, regulation, control and permitting to create a new entity, a so-called credit which would be intended to help foster scrap tire disposal. This complex structure would impose a burden on the tire manufacturer or importer, including the automobile and truck importers of this country, to create and require credits equal to a specified and increasing percentage of tires sold or imported.

The credit approach does little more than to hold the tire industry hostage to the credit sellers, who may demand any amount for credits. To the extent that we must buy credits, this approach mirrors somewhat the PURPA act, whereby utilities must buy electricity from small generators. PURPA, however, only requires the purchase price to be at a cost avoidance price of generating electricity to meet demand. With the tire credit, there was no limit imposed, and, given the unrealistic annual increases of 5 percent of the credit generating mechanism, credit prices could be out of reach for many companies.

In addition, the tire reclaiming community would have to comply with regulations which would define how they would create credits and who could sell those credits. Governmental officials would become the final arbiters of whether new technology for the use of tires would be allowed rather than any concept of a free market.

Frankly, throughout this legislation there are open-ended grants of authority to various departments to promulgate regulations with little legislative guidance. It does not take much to envision the system running amuck.

The dimensions of scrap tire disposal are well known. Nationwide we scrap approximately one tire per person per year. In total, our country scraps around 230 to 240 million tires each year, and the scrap tire inventories are between 2 and 3 billion tires. Looked at somewhat differently, approximately 4 million tons of tires are scrapped each year. This contrasts with 86 million tons of paper and 11 million tons of glass or is around 1 to 1.5 percent of the national municipal solid waste stream.

As you noted, at the outset we note that our legislation says that tires do not cause problems with properly disposed of in landfills, that they are not chemically active and do not add harmful compounds to the environment. We do recognize that they occupy space, but proper disposal including shredding or slicing before landfilling eliminates the problem of whole tires in landfills. As a cut or shredded unit in a landfill, a tire poses no particular problems.

The rubber industry has been and remains in the forefront of research-defined uses for scrap tires. We set this forth more fully in our testimony.

We have been active in the States, and we continue to be so because we think that that is an important arena. At present, some 27 States have passed various laws dealing with scrap tires.

I would like to very quickly summarize a couple of the disposal and recycling options. Reduction, according to the EPA, is the highest use. We take great pride in the tire industry that through the development of much longer lived tires we have contributed substantially in reducing the number of tires scrapped annually. Since 1980, automobiles in use have increased 25 percent, while replacement tire sales, a good indicator of scrap tires, has increased only 2 percent.

Reuse, finding ways to extend the useful life of the product, contributes substantially. Retreading and repairing are the two technologies in the tire industry. Tire retreading deserves special mention, with nearly 40 million tires being retreaded annually.

Retreading is the most effective means of product life extension and is a thoroughly market driven technology, at least in the medium truck market. In fact, the demand for medium truck tire retreads requires that our people as new tire manufacturers produce casings which are able to be retreaded and, in addition, we find that there are approximately $2.8 million waste tires from other countries imported to the U.S. to meet the demand for retreading.

I realize my time has pretty much expired. I would like to make two final comments, however. The first deals with recycling and specifically the use of reclaimed or recycled rubber to make new tires. Frankly, that is not high. It has been in the range of 0 to 5 percent, depending upon the type and construction of tire.

Because there has been some interest in this issue, we have asked tire industry experts in materials and tire technology to review current use and identify limitations, if any, on greater use. At the outset, you have to understand that it is not technologically possible to return once vulcanized rubber to a virgin state. Whether it is a crumb or a processed reclaim, it does not have the same physical or chemical properties. It is, in fact, a mixture of various rubber compounds and contains varying quantities of key materials such as carbon black and filler.

Recycled rubber when used in various tire rubber compounds affects that compound in various ways. It reduces tensile strength and elongation, thus affecting tread life, abrasion resistance, fatigue resistance and mileage. It increases heat buildup, which results in higher rolling resistance, thus adversely affecting gas mileage.

I might note that that increase in gas mileage would conflict directly with the CAFE requirements for higher fuel economy in automobiles.

The tire industry continues to conduct testing to evaluate the use of recycled rubber and does use it where appropriate as a filler or as a processing aid consistent with product safety and performance.

Finally, we would note and commend the sponsors of this legislation that they clearly recognize in the finding section the high energy content of a tire, the strategic value to the economy of the recovery of that energy, and that the technology for energy recovery presently exists. Unfortunately, the legislation does not follow through and intends to downgrade energy recovery in its credit section.

At the end of the hierarchy of solid waste management, we find disposal. There will continue to be a need for tires to have access to landfills and stockpiles. We do believe that through cutting and shredding we can greatly reduce the volume and, hence, the acceptability of tires to some extent in landfills.

The tire industry recognizes, in conclusion, that it has a responsibility to play a strong leadership role in helping find solutions to the scrap tire problem. We believe, however, that the burden is shared with all elements of society which enjoy the value provided by a product so essential to our national mobility as the tire.

The tire industry both through individual company activities and collectively through the RMA and the Scrap Tire Management Council is sincerely committed to expanding responsible and reasonable scrap tire recycling and disposal. This activity will accelerate. In addition, we would hope to be able to work with Federal, State, and local legislators and regulators to increase the economically viable markets for scrap tires and to reduce noneconomic barriers to better scrap tire utilization.

We welcome continuing discussions to develop responsible legislative assistance to help solve this problem. Thank you.

[The prepared statement of Mr. Serumgard follows:]

TESTIMONY

Presented on behalf of The Rubber Manufacturers Association

before the

Subcommittee on Energy Regulation and Conservation

of the

Committee on Energy and Natural Resources
United States Senate

August 2, 1990

The Rubber Manufacturers Association appreciates this opportunity to meet with the Subcommittee on Energy Regulation and Conservation of the Committee on Energy and Natural Resources to discuss the scrap tire issue and present its views on Title II of S. 2923, the "Resource Production and Conservation Act of 1990", amending Title III of the Energy Policy and Conservation Act. I am John Serumgard, Vice President, Tire Division for the Rubber Manufacturers Association. The Rubber Manufacturers Association is the principal trade association of the rubber products industry, and includes in its membership virtually all of the companies manufacturing tires in the United States.

The tire industry has long been involved in the efforts to find economically sound and environmentally acceptable methods of scrap tire disposal. As this nation confronts a growing concern for the problems of solid waste disposal, the tire industry is ready to expand its participation in the broad effort to find solutions to the special problems presented by scrap tires. We are prepared to work with all parties at the local, state and federal levels and with the private sector to develop and implement tire disposal and recycling options. As the broad range of participants in this hearing demonstrate, no one person, no one company, no one disposal strategy, will suffice to solve these problems. However, with cooperation among all concerned, with a sincere desire to find and implement solutions, we do believe that these problems can be solved.

To add substance to its effort, the tire industry has just established a new Council, the Scrap Tire Management Council, which has the mission of assisting in developing and promoting the utilization of scrap tires as a valuable resource, in an environmentally and economically sound manner. Over the next five years, the Council and its full time staff will be devoted to reaching its strategic objective of increasing the environmentally sound utilization of scrap tires to more than 50 percent of annual scrap tire generation.

The dimensions of scrap tire disposal are well known. Nationwide we scrap slightly less than 1 tire for each person each year. Thus each state can estimate the size of its needs for scrap tire disposal options by looking at its population. In total, our country scraps approximately 230 - 240 million tires each year, and has scrap tire inventories which total between 2 and 3 billion tires, according to knowledgeable experts. While a few tire piles may contain 10 million or more tires, most contain from a few thousand to a few hundred thousand. Looked at somewhat differently, approximately four million tons of tires are scrapped each year. This contrasts with 86 million tons of paper or eleven million tons of glass, and is around one to two per cent of the national municipal solid waste stream.

Scrap tires are properly categorized as a special waste problem. They are not a hazardous waste and they should not be considered so. In addition they are not routinely part of the household waste stream but generally are collected through a separate dedicated collection network. There are several methods of disposal and reuse, and many of these methods will be discussed later today. However, we do recognize that the majority of tires are going either to landfills or to tire stock piles as the ultimate disposal option, and these are not the preferred ends for scrap tires. Stock piles in particular present a range of difficult problems.

Improperly managed, stock piles could be habitats for mosquitos and other undesirable fauna, and they could present a fire risk. The tire industry has recognized these problems. The RMA Tire Storage Committee, working with the National Fire Protection Association, was instrumental in developing standards for proper scrap tire storage which require windrowing of tires, adequate fire lanes, and other appropriate control measures. These standards are published as NFPA Standard 231-D.

It has always been understood within our industry that tires do not cause problems when properly disposed of in landfills, that they are not chemically active and do not add harmful compounds to the environment. However, until recently there was no data to support that belief. To fill this data gap, the Association conducted a leachate study to determine what happens to rubber wastes. The study was conducted in conformity with the EPA's TCLP protocol by Radian Corporation, an independent contractor with great credibility in the environmental field. I am happy to say that the results of that study demonstrate that tires do not exceed allowable levels of chemicals or compounds currently regulated by EPA and thus do not present a problem to the environment. A copy of this study is attached to this testimony.

The rubber industry has been and remains in the forefront of research to find uses for scrap tires. More than 20 years ago, industry members conducted the development activity which demonstrated that scrap tires could be safely used to build fish reefs and breakwaters, technologies which are now used worldwide both to dispose of scrap tires and to improve fishing. During the seventies, several of our member companies conducted basic research on pyrolysis as a tire recycling technology and determined that while it was technically feasible, its economics would not support full scale utilization. Recovery materials such as the oil and char were not of the quality that these materials could be reutilized as raw materials in the manufacture of new tires.

Other industry companies undertook investigations of various energy recovery technologies including the use of whole tires as a fuel supplement. Continuing into the eighties, the industry supported various strategies which hold the promise of contributing significantly to the resolution of the tire disposal problem, including the use of shredded tires as tire derived fuel (TDF), and whole tire incineration to generate electricity. Early in the eighties, as the energy crisis reached a peak, much attention was directed toward the energy value of tires, especially in such uses as a fuel supplement in cement kilns, pulp and paper mills and industrial boilers.

State Legislative Activity

In addition, beginning in the mid-eighties, many states began considering legislation to deal with scrap tire disposal. RMA and our member companies have taken an increasingly active role in this state level activity, and have developed an outline of model legislation to assist states. A copy of this outline is attached to this testimony to indicate the scope of the industry's approach to control of the scrap tire issue. Briefly summarized, this model bill calls for:

1. A study by the state to determine the extent of disposal problems and the range of available or possible options;
2. Regulation of scrap tire haulers and processors to ensure compliance with proper disposal practices, including those standards published in NFPA Standard 231-D;
3. Prohibition of scrap tire disposal except in conformity with this law;
4. A funding mechanism intended to be used to promote scrap tire disposal options through grants, loans or rebates, to help clean up tire piles, and to evaluate the entire program; and
5. A sunset of the funding mechanism after an appropriate period of time.

We continue to refine this model bill and are considering additional features to suggest that disposal sites be mandated on a local or county level.

At present, some 27 states have passed various laws dealing with scrap tire disposal, and another 10-15 have or are considering such legislation. RMA and the other tire industry associations including national, state and local tire dealer groups have been involved in these states to help secure passage of reasonable and responsible legislation. In addition, we have continued to work with state regulators to insure that the implementing state regulations have been fair and responsible. We believe we have gained a reasonable level of credibility through these efforts and will continue to be involved in such state activities.

Disposal and Recycling Options

There are a variety of methods of dealing with scrap tires. To provide some structure to reviewing these options, we can match them with the EPA's established hierarchy of methods of solid waste disposal.

Reduce: At the highest level, the optimum strategy is to reduce the number or volume of products which will later need disposal. In the tire industry, we take pride that through the development of much longer lived tires we have contributed substantially in reducing the number of tires which are scrapped annually. Today's modern radial tire lasts more than twice as long as the tire technology which it replaced, and does so with better performance and safety. Thus the industry already has had an impact in reducing the volume of waste material which would otherwise have been created.

Reuse: Finding ways to extend the life of the product also contributes substantially to reducing the annual volume of waste. In the tire industry, this takes several forms, the most important of which are retreading and repairing.

Repairing is the process of properly and professionally fixing cuts and punctures so that a tire casing can be safely returned to service. The tire industry continually promotes the effectiveness of proper repairs.

Tire retreading deserves special mention, with nearly 40 million tires being retreaded each year. Retreading is the most effective means of product life extension for the tire and is a thoroughly market driven technology, at least in the medium truck market. The market for new medium truck tires now requires that casings be retreadable, and the new tire industry has worked hard to meet those demands. It would be fair to say that most medium truck casings have not achieved their full design life if they have not been retreaded several times. In fact, the demand for retreaded medium truck tires is so great that we do not produce enough used tire casings to supply the demand. Accordingly, as estimated by the American Retreaders Association, the United States imports 2.8 million worn out tires from other countries to meet the need for casings to be retreaded. Tire retreading is an important component in extending tire useful life and must be encouraged, and the new tire industry continues to work hard on producing casings better able to withstand multiple tread lives.

However, while the medium truck tire is a great retreading success, the passenger tire market has not been a success. The market for retreaded passenger tires is adversely affected by the availability of low priced import new tires.

Other methods of reuse include the use of scrap tires in agriculture, and the exportation of used tires to other countries.

Ultimately, however, even the 500,000 mile truck casing which may have worn out three or four treads will come to the end of its life and be just another scrap tire needing further use or disposal.

Recycle: Recycling of a waste product can either be closed loop, where the material in the waste product is used to make a new unit of the same product, or open loop, where the material is used in a different product.

With tires, closed loop recycling would entail the use of reclaim or crumb rubber recovered from waste tires to make new tires. Frankly, the current use of recycled rubber in new tires is not high, being in the 0-5% range depending on the type and construction of tire. Because there has been some interest in this issue, we asked industry experts in materials and tire technology to review current use and identify the limitations, if any, on greater use. At the outset, it must be understood that it is not technologically possible to return once vulcanized rubber to a virgin state. Thus whether the recycled rubber is a crumb or is a processed "reclaim", it does not have the same physical or chemical properties as a virgin natural or synthetic rubber, and is in fact a mixture of various rubber compounds, containing varying quantities of key materials such as carbon black and fillers. Recycled rubber when used in various rubber compounds affects the compound in various ways: it reduces tensile strength and elongation, thus reducing tread life, abrasion resistance, fatigue resistance and mileage; it increases heat build up which results in higher rolling resistance, thus adversely affecting gas mileage. The tire industry continues to conduct testing to evaluate the use of recycled rubber, and does use it where appropriate either as a filler or as a processing aid, consistent with product safety and performance.

One issue which warrants special comment is the suggestion that use of recycled rubber is an economic issue. In the present day the use of recycled rubber in new car and truck tires is totally a technical issue. Given the tremendous physical demands placed on tires, tire manufacturers must have as their highest priorities the safety and performance of their new tires. Thus the negative effects of recycled rubber on compound performance noted above are the major consideration in the use of recycled rubber, not economic considerations.

In new tire manufacture, the emphasis is on product safety, quality and performance. New passenger car tires are already subject to two separate federal regulatory systems, the Federal Motor Vehicle Safety Standards system and the Uniform Tire Quality Grading system. Tire manufacturers are constantly striving to improve the quality, durability and performance of their products. Current radial passenger tires provide from 40,000, to 60,000 miles or more of safe, dependable transportation.

There are, however, a number of uses in products other that tires for recycled rubber.

Reclaimed or ground rubber materials can be used in a variety of non-tire rubber products such as floor mats, carpet backing, molded goods, rail road crossings, etc. Whole or cut tires can be used in applications such as reefs, breakwaters, floor mats, dock bumpers, road bed mats, etc.

Shredded tires can be put to other uses. They can be used as a geosynthetic material as light weight fill for use in road construction and for daily cover or in the leachate bed in landfills. Shredded or ground rubber can be used as a soil conditioner where compaction is a problem. One of the more promising technologies for the future is the use of ground rubber in asphalt road construction. A wide variety of state and local demonstration projects have been successfully undertaken, and many other countries have also investigated this technology. While some commentators have suggested that more developmental work is needed before rubber modified asphalt is acceptable, it may be time to make some decisions based on the extensive testing already done, and to move to more widespread use of this technology. At present, asphalt rubber consumes only a minimal number of scrap tires. Admittedly, at present rubber modified asphalt is more costly than regular asphalt and thus faces other non-technical barriers at the state and local levels.

Whole tire recycling is also possible. The use of tires to build fish reefs and breakwaters is a well understood technology. Other uses of whole tires include crash barriers, construction materials and erosion control. In addition, many inventors are working to use whole and cut tires in a wide variety of innovative ways. All of these efforts should be encouraged where they are environmentally sound.

To date, few of the reuse or recycling technologies have demonstrated the capacity to provide an ultimate disposal solution for large volumes of tires. Even if all non-tire rubber products were made from recycled tires, less than one half of scrap tires would be utilized as seventy percent of all rubber is used in tires.

Recovery: At present, energy recovery is the disposal option which presents the best economic opportunity for responsible disposal of a substantial number of scrap tires. We are very encouraged that the legislation before us today clearly recognizes in its "Findings" section of Title II the high energy content of a tire, the strategic value to the economy of the recovery of that energy and that the technology for energy recovery presently exists.

Tires can be used as a fuel in both whole or processed form. Chopped or shredded tires as TDF can be used as a supplemental fuel in a wide variety of applications in an environmentally sound manner, and pound for pound contain a higher BTU content than most coal. Among the current and future users of TDF are pulp and paper mills, cement kilns and utility and industrial boilers. Whole and shredded tires are also used in mass-burn municipal incinerators to help provide the necessary heat value to insure proper burning.

Whole tires can also be used in energy recovery, either as a supplemental fuel, or in dedicated whole tire burning facilities. For a variety of reasons, tires make an excellent fuel source with very manageable emissions.

Furthermore, we believe the potential users of scrap tires as fuel are beginning to take a more serious look at this resource. We are heartened by this interest, and will seek to encourage it through the Scrap Tire Management Council.

Disposal: At the end of the solid waste hierarchy lies disposal, typically in a landfill.

As was noted earlier, the majority of tires presently are being landfilled or stockpiled. Even as the higher disposal options for tires are developed and fewer tires are directed to these options, there will continue to be a need for tires to have access to landfills and stockpiles. However, much can be done to help minimize disposal problems. Cutting or shredding tires before landfilling greatly reduces volume and eliminates adverse problems associated with landfilling whole tires. In addition shredded tires can take the place of dirt as daily cover in landfill operations, and can be used elsewhere in landfills. Shredding or cutting tires before stockpiling eliminates the mosquito problem and can greatly reduce the fire hazard. In addition, shredding tires before monofilling presents better product to recover should markets later develop.

Federal Legislation

"The Resource Production and Conservation Act of 1990", is the most extensive Senate legislative proposal yet presented on scrap tires.

We approach this legislation with the understanding that it is intended to begin a dialogue on an issue of major national importance, that it is a first proposal intended to stimulate discussion and consideration of alternative federal approaches on this issue. We share with the sponsors a strong desire to help find environmentally sound and economically viable solutions to the problems presented by scrap tires, and to consider the appropriate role for federal legislation. We do not differ on the goal of sound scrap tire disposal; if we do differ on the specific approaches proposed in the legislation, it is done out of a desire to find reasonable, effective solutions and to test any proposal to ensure its soundness.

At the outset, we note that the standard and labeling requirement set forth in Section 202(a)(3) of the bill appears to be very similar to requirements which already exist under the Uniform Tire Quality Grading regulations administered by the Department of Transportation. We do not understand the need for the addition of yet another testing and labeling system.

An additional labeling requirement is proposed in Section 202(a)(2) for a label to attach to new and retreaded tires to advise tire owners of the adverse impact of improper tire disposal and the positive effects of proper tire disposal. While this is an admirable goal, in order for this provision to be effective the tire dealer must be required to provide the label or a similar written document to the tire purchaser. The tire consumer normally would not see the label before the tire is mounted, and during mounting the label would be removed in order to properly balance the tire.

As we view this legislation, it would create a highly complex structure of definition, regulation, control, and permitting to create a new entity, a so called "credit", which would be intended to help foster scrap tire disposal. This complex structure would impose a burden on the tire manufacturer or importer to create or acquire credits equal to a specified, and increasing percentage of tires sold or imported. In addition, the tire reclaiming community would have to comply with regulations which would define how they could create credits and how they could sell those credits. The Secretary of Energy would become the final arbiter of whether a new technology for the use of scrap tires would be allowed, rather than any concept of a free market. Frankly, throughout this legislation there are open ended grants of authority to various Departments to promulgate various regulations with little legislative guidance. It does not take much to envision a system run amuck because of poor regulations.

Thus auto and truck importers, as well as tire manufacturers and importers would be in the market for credits, if they could not create sufficient credits by reusing recovered rubber in new tires or retreading sound casings. Credits could only be created by reclaimers who have secured permits under section 338(b), but that section has no provision for the issuance of regulations under which permits could be issued.

While the findings section clearly identifies energy recovery as the most viable method of scrap tire utilization, the schedule of credits does not follow through with that concept, downgrading energy recovery.

To be effective, scrap tire regulation must first control the scrap tire stream from the point of creation to final disposal. Then attention can be turned toward market expansion or creation, toward consumption or conversion.

However, it is unclear how the proposed credit system is intended to expand markets for scrap tire products, including energy recovery. Rather it appears to be a system to penalize tire manufacturers for failing to recycle used tires by reusing them in new tires.

Although no similar credit system is currently in operation so that we could examine whether such a system actually works, this legislation also deals with two waste products for which similar credit systems are proposed - waste oil and newsprint. In each case, the technology exists to reclaim the waste product and reuse it for its original purpose - as engine oil or as newsprint respectively. A credit system in such case may in fact work to cause the manufacturers of the virgin product to reclaim and reuse the waste product, if no other more economically viable market exists. Thus the manufacturer of the original product can decide whether he wants to control the process and undertake the steps necessary to recover and recycle the waste product back into his new product, or else rely on outside forces to create the needed credits.

This condition does not exist with respect to tires. As was discussed earlier, there are critical technical reasons for the limited use of recycled rubber in new tires. Importers, including automobile companies, may not manufacturer new tires in this country, and they are unlikely to be involved in retreading domestically. The tire manufacturer or importer would not be able to exercise the same level of control as the newspaper or oil producer.

Thus in the case of tires, there would be a much more complex structure of reclaimers, including local and county governments which collect and shred tires, private tire shredders, tire retreaders, cement kilns, paper mills and other users of whole or shredded tires as fuel, tire crumbers, producers of molded rubber and plastics products which incorporate crumb rubber, state highway departments, local city street departments, and a myriad of inventors and entrepreneurs who are working on new uses for scrap tires. Clearly there would be a heavy burden on the regulators of the credit creation and auditing system, just as there would be a heavy and unnecessary administrative burden on tire manufacturers and importers and on vehicle importers to insure that credits were properly created and sold.

Alternatives

The tire industry recognizes that it has a responsibility to play a strong leadership role in helping find solutions to the scrap tire problem. However we believe that the burden is shared with all elements of society which enjoy the value provided by a product so essential to our national mobility as the tire.

Furthermore, we believe that there can be value in the scrap tire, a value which many potential markets are beginning to realize. The role of government is very important to help control the scrap tire stream and to divert it from the least desirable disposal methods, the illegal and uncontrolled dumping of tires on the landscape. The role of government also includes appropriate regulation for health and safety of all legal disposal alternatives, including properly permitted stock piles and landfills. When the potential users of scrap tires are confident of a steady source of supply which will not be undercut by the illegal disposer, they will be more inclined to use the material.

State governments are taking an increasing role in this police and regulation activity. In addition, many have undertaken more direct economic assistance to initiate scrap tire disposal alternatives.

The tire industry, both through individual company activities and collectively through the Scrap Tire Management Council, is sincerely committed to expanding reasonable, responsible scrap tire recycling and disposal. That activity will accelerate in the immediate future. In addition, we would hope to be able to work with federal, state and local legislatures and regulators to increase the economically viable markets for scrap tires and to reduce the non-economic barriers to better scrap tire utilization. We welcome continuing discussions to develop responsible legislative assistance to help solve this problem.

20th Anniversary
RADIAN CORPORATION

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ATTACHMENT 1

RMA LEACHATE STUDY

A REPORT ON THE RMA TCLP ASSESSMENT PROJECT

PREPARED FOR
THE RUBBER MANUFACTURERS ASSOCIATION

WASHINGTON, D.C.

SEPTEMBER 25, 1989

RMA.
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1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

PROJECT SCOPE: The Rubber Manufacturers Association (RMA) authorized Radian Corporation to assess what levels of chemicals, if any, are leached from representative RMA products using EPA's proposed Toxicity Characterization Leaching Procedure (TCLP). The TCLP proposes to add chemicals to the existing list of compounds regulated under Subtitle C of the Resource Conservation and Recovery Act, and to introduce new extraction methods.

RESULTS OF THE TCLP STUDY: None of the products tested, cured or uncured, exceeded proposed TCLP regulatory levels. Most compounds detected were found at trace levels (near method detection limits) from ten to one hundred times less than proposed TCLP regulatory limits. In only one test was a proposed limit approached. Methyl ethyl ketone (MEK), was detected in the TCLP leachate of a printer roller product at 7.0 mg/L. The proposed TCLP limit is 7.2 mg/L.

EP TOXICITY COMPARISON: Additional work was performed to compare the results of EP Toxicity procedures with the proposed TCLP for RMA products, the results from the two leachate methods were comparable.

EFFECTS OF LEACHING UNGROUND SAMPLES: Radian also compared the effect of a modification to the TCLP recently proposed by EPA which would eliminate grinding prior to leaching; in effect making TCLP tests of rubber products more representative of disposal practices. The results inherent in ground and unground samples were comparable. Uncertainties in the TCLP procedure had a greater impact on the variability of the results than differences in ground and unground methods.

1.2 SCOPE OF THE RMA STUDY

The Toxic Characteristic Leaching Procedure (TCLP) was proposed as an amendment to EPA's hazardous waste identification regulations (40CFR Parts 261, 271, and 302) on June 13, 1986 in the Federal Register/Vol. 51, No. 114. It is the intent of EPA to replace the current waste characterization method (EP Toxicity) with the TCLP.

1.2.1 THE TCLP STUDY

In anticipation of a change in waste characterization methodologies, the Rubber Manufacturers Association (RMA) authorized Radian Corporation to perform a study to assess what levels (if any) TCLP pollutants may be leached from representative cured and uncured products manufactured by RMA members.

TCLP tests were performed on the following RMA member products.

7 products from tire manufacturers
1 product from a roofing product manufacture
3 products from belt/hose manufacturers
3 products from molded product manufacturers
1 product from a gasket/sealant manufacturer
1 product from a manufacturer of printer rollers

For the study Radian utilized the list of chemicals and methods taken from the proposed June 13 TCLP regulations. Since pesticides and herbicides are not found in member products, these listed pollutants were not included in the scope of this study.

The TCLP listed chemicals studied in this program and their regulatory limits are shown below.

	Contaminant	Regulatory Level
Volatile Organics	Acrylonitrile	5.0 mg/L
	Benzene	0.07
	Bis(2-choroethyl)ether	0.05
	Carbon Disulfide	14.4
	Carbon Tetrachloride	0.07
	Chlorobenzene	1.4
	Chloroform	0.07
	1,2-Dichlorobenzene	4.3
	1,4-Dichlorobenzene	10.8
	1,2-Dichloroethane	0.40
	1,1-Dichloroethylene	0.10
	2,4-Dinitrotoluene	0.13
	Hexachlorobutadiene	0.72
	Isobutanol	36.0
	Methylene Chloride	8.6
	Methyl Ethyl Ketone	7.2
	1,1,1,2-Tetrachloroethane	10.0
	1,1,2,2-Tetrachloroethane	1.3
	Tetrachloroethylene	0.1
	Toluene	14.4
	1,1,1-Trichloroethane	30.0
	1,1,2-Trichloroethane	1.2
	Trichloroethylene	0.07
	Vinyl Chloride	0.05
Semivolatile Organics	o,m,p-Cresols (ea)	10.0
	Hexachlorobenzene	0.13
	Hexachloroethane	4.3
	Nitrobenzene	0.13
	Pentachlorophenol	3.6
	Phenol	14.4
	Pyridine	5.0
	2,3,4,6-Tetrachlorophenol	1.5
	2,4,5-Trichlorophenol	5.8
	2,4,6-Trichlorophenol	0.30
Metals	Arsenic	5.0
	Barium	100
	Cadmium	1.0
	Chromium	5.0
	Lead	5.0
	Mercury	0.20
	Selenium	1.0
	Silver	5.0

1.2.2 EP TOXICITY COMPARISON

Radian also compared the results of the TCLP analyses to the results of tests on selected RMA products using the current waste characterization protocol, EP Toxicity. Pesticides and herbicides were not included in the comparison.

1.2.3 TLCP CAGED MODIFICATION

A modification to the TCLP procedure was proposed by EPA in the Federal Register on May 24, 1989 which would allow certain categories of waste to undergo TCLP without being ground This would include most RMA member products.

Although TCLP originally had no provision for the pre-testing of physical integrity of a product before subjecting it to the leaching process, the EP Toxicity procedure does. This EP Toxicity test is referred to as the SIP (structural integrity test).

EPA recognized that TCLP should have a test similar to the structural integrity test and proposed to use a stainless steel cage in a glass bottle to contain whole, non-friable samples during the leaching process. ASTM is studying a cage made of plastic rather than stainless steel to avoid contamination by metals leached from the cage during the process.

The purpose of the cage is to shield the glass tumbler in which the whole sample is leached from hard, rock-like wastes. As initially proposed, TCLP required waste to be reduced so that it would pass through a 9.5 mm sieve.

Unlike vitrified or solidified wastes, the rubber products being studied for this project could not harm the tumbler when inserted as unground samples and therefore no caging apparatus was required.

1.3 PROJECT COORDINATION

Radian anticipated the need for confidentiality in this program and assigned codes to the participating manufacturers. The codes were assigned and maintained by Mr. Robert Richardson, the Radian manager for this project.

Radian provided participants with a detailed sampling protocol written to ensure that the samples provided to the laboratory were representative of the whole product and were not contaminated by the sampling process. To expedite prompt delivery, Radian also provided pre-labeled sampling containers to the participating manufacturers.

Initial processing of the samples to the appropriate (< 1 cm) size was done in Radian's Material Science Laboratory in Milwaukee, Wisconsin. This facility had appropriate hardware to grind and/or cut samples without contamination. All laboratory testing was performed at Radian's Austin facility. Data maintained at Radian are still coded. All laboratory operations conformed to EPA SW846 protocols for chain-of-custody, sample management, and laboratory analyses.

All analyses performed under EPA SW846 protocols applied the Third Edition methods and QC criteria.

2.0 RESULTS

2.1 PRODUCT CATEGORIES

The products contributed by RMA membership for the TCLP study included:

	NUMBER
TIRE PRODUCTS	
Truck tires	1
Light truck tires	2
Passenger Auto tires	4
ROOFING PRODUCTS	
Roofing - rubber sheet	1
BELTS/HOSE	
Automotive belts	2
Automotive hoses	1

	NUMBER
MOLDED PRODUCTS	
Automotive Weather Strip	1
Pipe Connecing Sleeve	1
Automotive Glassrun Channel	1
SEALANTS	
Caliper Boot Seal	1
PRINTING ROLLS	
Printer Roller	1

2.2 RESULTS SUMMARY

With the exception of methyl ethyl ketone (MEK) detected in the printer roller product, values of all organics and metals were well below proposed regulatory values. The printer roller MEK value was 7.0 mg/L. The proposed regulatory limit is 7.2 mg/L.

Data also indicated no significant differences between the TCLP procedure as initially proposed on June 13, 1986 and the modified "caged" method proposed on May 24, 1988.

Finally, the data showed no consistant differences in levels of metals leached by the EP Toxicity procedure (cured and uncured samples) when compared to the TCLP extraction procedure.

2.3 DATA ANALYSIS

2.3.1 TCLP PROTOCOL ANALYSES FOR CURED SAMPLES

The concentrations of TCLP compounds detected in cured product samples leached and analyzed by the June 13, 1986 procedures are summarized in Table 1. For comparative purposes the proposed limits are provided at the heading of each column.

Although constituents listed by TCLP as hazardous compounds were found in all test categories, none exceeded proposed regulatory levels. Methyl ethyl ketone was detected in the printer roller sample at 7.0 mg/L. The proposed limit is 7.2 mg/L.

Most compounds were found at trace levels from ten to one hundred times less than TCLP regulatory limits. Many TCLP listed chemicals were not detected in any of the cured samples. These are listed below.

TCLP Listed Chemicals Not Detected* In
Cured Samples

Metals

Silver

Volatile Organics

Acrylonitrile
Benzene
Carbon Tetrachloride
Chlorobenzene
Chloroform
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
Trichloroethylene
1,2--Dichloroethane
1,1-Dicholorethene
Isobutanol
Methylene Chloride
1,1,1,2-Tetrachloroethane
Tetrachloroethylene
1,1,2-Trichloroethane
Vinyl Chloride

Semivolatiles

This list continues following Table 1.

---

* Not detected at or above method detection limits

TABLE 1.

TCLP PROTOCOL TEST - POSITIVE RESULTS

UNITS: mg/L

MDL = Method Detection Limits
a,f = TCLP cured

	VOLATILES			SEMI-VOLATILES	METALS						
SAMPLE ID	Carbon Disulfide	Methyl Ethyl Ketone	Toluene	Phenol	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium
MDL	0.005	0.1	0.005	0.01	0.001	0.01	0.005	0.01	0.002	0.0002	0.002
Regulatory Level	14.4	7.2	14.4	14.4	5	100	1	5	5	0.2	1
TIRE PRODUCTS											
1a	0.034	•	0.011	0.013	•	0.063	•	0.048	•	0.0002	•
2a	0.035	•	0.007	0.010	•	0.065	•	0.020	0.018	•	•
3a	0.007	0.021	0.050	•	•	0.150	•	0.012	0.008	•	•
4a	0.017	•	0.010	0.022	•	•	•	0.035	0.014	•	•
5a	•	•	0.100	0.048	•	0.570	•	0.037	0.002	0.0004	•
6a	•	•	•	0.045	•	0.080	•	0.025	0.002	•	•
7a	•	•	0.020	•	•	0.021	•	0.047	0.018	•	•
ROOFING PRODUCTS											
8a	0.100	•	0.007	•	•	0.045	•	•	0.014	•	•
BELTS/HOSE											
9a	0.020	•	0.038	1.30	•	0.080	•	•	0.005	•	•
9f	0.032	•	3.000	•	•	0.012	•	•	0.300	•	•
10a	0.700	•	0.240	0.084	0.007	0.012	0.006	•	0.003	•	0.003
MOLDED PRODUCTS											
11a	0.400	•	0.053	•	•	0.039	•	•	•	•	•
12a	0.320	•	0.074	•	•	0.540	•	•	0.007	•	•
13a	0.035	•	•	•	0.003	0.018	•	•	0.008	•	•
SEALANTS											
14a	•	•	•	•	0.004	0.018	•	0.030	0.030	•	•
PRINTING ROLLS											
15a	2.80	7.00	0.018	•	•	•	•	•	0.008	•	f

• These compounds were not detected or detected below method detection limits.

**TCLP Listed Chemicals Not Detected* In
Cured Samples, Cont.**

Semivolatile Organics

Bis(2-chloroethyl)ether
1,2-Dichlorobenzene
2,4--Dinitrotoluene
Hexachlorobutadiene
Nitrobenzene
Pyridine
2,4,6-Trichlorophenol
o,m,p-Cresols
1,4-Dichlorobenzene
Hexachlorobenzene
Hexachloroethane
Pentachlorophenol
2,3,4,6-Tetrachlorophenol
2,4,5-Trichlorophenol

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* Not detected at or above method detection limits

2.2.2. A COMPARISON OF CURED VS. UNCURED SAMPLES USING TCLP

Selected uncured samples representing each RMA product group also underwent TCLP leaching and analysis. Each uncured sample selected for the study had a matching cured product which also had undergone TCLP leaching and analysis. Two samples were selected from the tire products group and one sample was selected from each of the remaining product groups. The comparative cured and uncured sample results are shown in Table 2.

Note that the uncured printer roller sample values for methyl ethyl ketone (MEK) were 2.3 mg/L and were 7.0 mg/L for the cured sample.

As with the cured samples, the TCLP leachates of uncured samples did not exceed proposed regulatory limits. In comparing leachates from cured and uncured products, no consistent trend could be identified in the analysis results. For example, carbon disulfide values of cured samples exceeded uncured samples for two product categories and the profile was reversed for two other product categories.

TABLE 2.

TCLP PROTOCOL: A COMPARISON OF CURED AND UNCURED SAMPLES

UNITS: mg/L

MDL = METHOD DETECTION LIMIT
a = TCLP (cured)
b = TCLP (uncured)

	VOLATILES					SEMI-VOLATILES	METALS					
Sample ID	Carbon Disulfide	Methyl Ethyl Ketone	1,1,1-Tri Chloroethane	1,1,2,2-Tetra Chloroethane	Toluene	Phenol	Arsenic	Barium	Chromium	Lead	Mercury	Selenium
MDL	0.005	0.1	0.005	0.005	0.005	0.01	0.001	0.01	0.01	0.002	0.0002	0.002
Regulatory Level	14.4	7.2	30	1.3	14.4	14.4	5	100	5	5	0.2	1
						TIRE PRODUCTS						
3a	0.067	0.021	*	*	0.030	*	*	0.150	0.012	0.006	*	*
3b	0.012	*	0.005	*	0.017	*	*	0.072	0.023	0.008	*	*
5a	*	*	*	*	0.190	0.048	*	0.570	*	*	0.0004	*
5b	*	*	*	*	0.120	0.059	0.002	0.037	0.025	0.008	*	*
						ROOFING						
8a	0.160	*	*	*	0.007	*	*	0.045	*	0.014	*	*
8b	0.010	*	*	0.008	0.017	*	0.004	0.064	*	0.019	*	0.009
						BELTS/HOSES						
9a	0.520	*	*	*	0.038	1.30	*	0.080	*	0.006	*	*
9b	0.069	*	*	*	0.150	0.068	0.001	0.069	0.018	*	*	*
						MOLDED PRODUCTS						
13a	0.035	*	*	*	< *	*	0.003	0.018	*	0.009	*	*
13b	0.080	*	*	*	0.022	*	0.005	0.047	0.010	0.019	*	0.003
						SEALANTS						
14a	*	*	*	*	< *	*	0.004	0.018	0.030	0.038	*	*
14b	*	*	*	*	0.012	*	0.002	0.030	*	*	*	*
						PRINTING ROLLS						
15a	2.00	7.0	*	*	0.018	*	*	*	*	0.009	*	*
15b	1.20	2.3	*	*	0.017	0.012	0.001	0.080	*	0.032	*	*

* These compounds were not detected or detected below method detection limits

The list of TCLP compounds not found in the uncured samples was substantial and included:

TCLP Listed Chemicals Not Found In
Uncured Samples

Metals

Silver
Mercury
Cadmium

Volatile Organics

Acrylonitrile
Carbon Tetrachloride
Chloroform
1,1-Dicholorethene
Methylene Chloride
Tetrachloroethylene
1,1,2-Trichloroethane
Vinyl Chloride
Benzene
Chlorobenzene
1,2-Dichloroethane
Isobutanol
1,1,1,2-Tetrachloroethane
1,1,1-Trichloroethane
Trichloroethylene

Semivolatile Organics

Bis(2-chloroethyl)ether
1,2-Dichlorobenzene
2,4-Dinitrotoluene
Hexachlorobutadiene
Nitrobenzene
Pyridine
2,4,6-Trichlorophenol
o,m,p-Cresols
1,4-Dichlorobenzene
Hexachlorobenzene
Hexachloroethane
Pentachlorophenol
2,3,4,6-Tetrachlorophenol
2,4,5-Trichlorophenol

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* Not detected at or above method detection limits

2.2.3 A COMPARISON OF TCLP GROUND VS. UNGROUND SAMPLES

The modification to TCLP proposed on May 24, 1988 will allow for TCLP leaching of unground samples. To test the effects of the proposed modification to TCLP, selected cured samples representing each RMA product group underwent TCLP leaching and analysis, but without the reduction of particle size below one centimeter.

An comparative assessment of volatiles was not performed. The proposed May 24 modification does not address TCLP Zero Head Space Extraction for volatiles. This extraction still requires the sample to be of sufficiently small size to be placed in to a compressible piston. For volatile organics, the study of ground "unground" samples would duplicate of the initial TCLP Zero Head Space leaching process conducted for the ground samples.

For comparative purposes, each of the unground, cured samples selected for the study had a matching ground, cured product which had undergone TCLP. This set of products also matched the uncured products which had undergone TCLP assessment. The comparative results for the ground and unground samples are provided in Table 3.

As with the ground samples, only trace levels of TCLP contaminants were found in the unground samples. Comparative differences between ground and unground samples can most likely be assigned to variances in sample constituency or analysis methods, rather than differences in the efficiency of the ground or unground approaches to leaching.

The list of TCLP compounds not detected above method detection limits in the unground samples includes:

TCLP Listed Chemicals Not Detected In
Unground Samples*

Metals

Silver
Cadmium

Semivolatile Organics

Bis(2-chloroethyl)ether
1,2-Dichlorobenzene
2,4-Dinitrotoluene
Hexachlorobutadiene
Nitrobenzene
Pyridine
2,4,6-Trichlorophenol
o,m,p-Cresols
1,4-Dichlorobenzene
Hexachlorobenzene
Hexachloroethane
Pentachlorophenol
2,3,4,6-Tetrachlorophenol
2,4,5-Trichlorophenol

---

* Not detected at or above method detection limits

TABLE 3.

TCLP PROTOCOL TEST
A COMPARISON OF GROUND AND UNGROUND SAMPLES
UNITS: mg/L

MDL = Method Detection Limit
a = TCLP (cured)
c = TCLP (unground, cured)

	SEMI-VOLATILES	METALS					
Sample ID	Phenol	Arsenic	Barium	Chromium	Lead	Mercury	Selenium
MDL	0.01	0.001	0.01	0.01	0.002	0.0002	0.002
Regulatory Level	14.4	5	100	5	5	0.2	1
		TIRE PRODUCTS					
[illegible]	*	*	0.150	0.012	0.006	*	*
[illegible]	0.048	*	0.140	*	0.019	*	*
[illegible]	0.048	*	0.570	0.037	*	0.0004	*
[illegible]	0.058	*	0.029	*	*	*	*
		ROOFING					
[illegible]	*	*	0.045	*	0.014	*	*
[illegible]	*	*	0.540	0.010	*	*	0.006
		BELTS/HOSES					
9a	1.30	*	0.560	*	0.005	*	*
9c	0.580	*	0.069	*	*	*	*
		MOLDED PRODUCTS					
13a	*	0.003	0.018	*	0.006	*	*
13c	*	0.004	0.031	*	0.008	*	0.003
		SEALANTS					
14a	*	0.004	0.018	0.030	0.038	*	*
14c	*	*	0.530	*	*	*	*
		PRINTING ROLLS					
15a	*	*	*	*	0.008	*	*
16c	*	*	0.800	*	*	*	*

* These compounds were not detected or were detected below method detection limits

2.2.4 A COMPARISON OF THE TCLP AND THE EP TOXICITY PROCEDURE

The results of these tests are provided in Table 4.

The EP Toxicity tests focused on metals, since the only organics in the EP Toxicity characterization procedure are chlorinated pesticides and phenoxychlorinated herbicides.

Silver, arsenic, mercury, and selenium were not found in the EP Toxicity leachates. The comparison of EP Toxicity leaches of cured and uncured products with the TCLP leachates of cured products showed very low (trace) values for all metals except barium in the sets. And barium values were less than one percent of regulatory limits. At these trace levels, no definitive trends between EP Tox cured, EP Tox uncured, and TCLP leachates could be isolated.

TABLE 4.

TCLP AND EP TOX METALS – COMPARING CURED AND UNCURED SAMPLES

UNITS: mg/L

MDL = METHOD DETECTION LIMIT
c = TCLP (cured)
d = EP Tox (cured)
e = EP Tox (uncured)

Sample ID	METALS					
	Arsenic	Barium	Chromium	Lead	Mercury	Selenium
MDL	0.001	0.010	0.01	0.002	0.0002	0.002
Regulatory Level	5	100	5	5	0.2	1
TIRE PRODUCTS						
3c	*	0.180	0.012	0.009	*	*
3d	*	0.073	*	0.018	*	*
3e	*	0.041	*	0.030	*	*
5c	*	0.570	0.037	0.002	0.0004	*
5d	*	*	*	0.006	*	0.002
5e	*	*	*	0.004	*	*
ROOFING						
8c	*	0.045	*	0.014	*	*
8d	*	*	*	0.007	*	*
8e	*	*	*	0.010	*	*
BELTS/HOSES						
9c	*	0.560	*	0.006	*	*
9d	*	*	*	0.003	*	*
9e	*	0.017	*	0.004	*	*
MOLDED PRODUCTS						
13c	0.003	0.018	*	0.008	*	*
13d	*	*	*	0.002	*	*
13e	*	*	*	0.005	*	*
SEALANTS						
14c	0.004	0.018	0.030	0.036	*	*
14d	*	*	*	*	*	*
14e	*	*	0.028	0.005	*	*
PRINTING ROLLS						
15c	*	*	*	0.008	*	*
15d	*	0.019	0.015	0.007	*	*
15e	*	0.013	*	0.037	*	*

* These compounds were not detected or detected below method detection limits.

3.0. TECHNICAL APPROACH

3.1 TCLP OVERVIEW

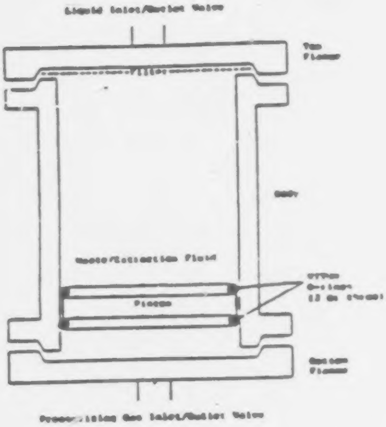
On June 13, 1986, EPA first proposed a rule intended to amend the waste characterization procedures to greatly expand the list of organic hazardous compounds by adding a volatiles extraction procedure (termed Zero Head Space) and by incorporating GCMS procedures for identification of both volatile and semivolatile organics. The proposed protocol was designated the Toxicity Characteristic Leaching Procedure or TCLP. Analytical methods used for both the EP Toxicity and the newer TCLP protocols remain those in EPA's RCRA analytical methods manual, SW846.

The purpose of TCLP, as well as the EP Toxicity protocol it was meant to replace, is to determine whether a waste has the potential to pose a significant hazard to human health or to the environment due to its propensity to leach toxic compounds into the groundwater.

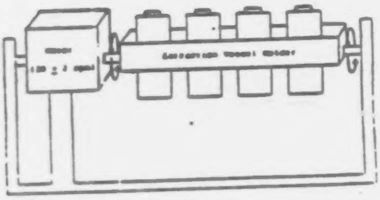
To leach semivolatile organics, pesticides, and metals the TCLP employs containment jar attached to a rotary tumbler spinning at a rate of 30 rmp. As noted above, the volatile organics are leached in a Zero Head Space apparatus, which is contains a self-enclosed piston system to force the leachate solution through a filter, effectively seperating the leaching medium from the sample without exposure to air. This apparatus is also attached to the rotary tumbler. The leaching solution for both processes is 0.1 M acetate buffer at a pH of 4.9 for non-alkaline wastes and pH 2.9 for alkaline wastes. Diagrams of both the Zero Head Space and Tumbler extractors are provided on the next page.

Other differences between the EP Toxicity procedure and TCLP included the extraction period (24 hours for EP Tox and 16 hours for TCLP) and initial abandonment of the EP Tox structural integrity procedure or SIP. As noted in the introduction, the EPA is seriously considering whether to reinstate some form of the SIP for monolithic wastes.

TCLP Extractors


Liquid Inlet/Outlet Valve
Top Flange
Filter
Body
Waste/Extraction Fluid
Piston
Viton O-rings (2 on Piston)
Bottom Flange
Pressurizing Gas Inlet/Outlet Valve

Zero-Headspace Extraction Vessel


Motor
(30 ± 2 rpm)
Extraction Vessel Holder

Rotary Tumbler

3.2 SAMPLING PROTOCOL FOR THE RMA PROGRAM

3.2.1 FIELD SAMPLING PROCEDURES

An example of the sampling instructions used in this project is provided as Appendix A. The sampling protocol written by Radian ensured both a coordinated effort among the participating companies and provision of samples representative of product constituents.

Radian provided participants with its SamplePak which contained collection and shipping instructions, chain-of-custody information, pre-cleaned containers, and prepared labels. The instruction set described above included use of containers, packing, security seal use, and shipping directions.

RMA participating companies provided samples of the products in sufficient quantity to provide TCLP ground and unground, TCLP uncured, and EP Tox analyses. The products analyzed included:

Item	Number Cured Product	Number Uncured Product TCLP Unground EP Toxicity
Tires	7	2
Belts/Hoses	3	1
Molded Products	3	1
Sealants	1	1
Roofing	1	1
Printer Rolls	1	1

3.2.2 LABORATORY SAMPLE PREPARATION

Samples were shipped by the participants to Radian's Material Science Laboratory in Milwaukee, Wisconsin for processing. Those portions identified for the standard TCLP analysis were chopped into portions of 1 cm or less. Care was taken by Radian staff to use oil-free cutting tools and to avoid friction with the rubber material so as not to change its chemical make-up. The processed samples were then forwarded to Radian's Austin, Texas laboratory for leaching and chemical analysis.

3.2.3 SAMPLE CONTROL

Sample control for this program was coordinated through the use of a computerized laboratory data management system (SAM), which was developed by Radian. Sample log-in was performed immediately upon receipt of samples, and a unique sample code was assigned. SAM tracked the progress of samples through the laboratories, including such items as sample storage location, tests to be performed, holding/expiration dates, and reporting deadlines. Sample security arrangements and chain-of-custody procedures were all performed according to EPA Contract Laboratory Program guidelines using written SOPs.

The sample control center is equipped with locked, limited-access refrigerators (4°C) and freezer (-20°C) storage space. Samples remained in the sample control center storage until they were needed for preparation and analysis. After analysis unused samples and extracts were returned and retained by sample control.

3.3 TCLP LEACHING AND CHEMICAL ANALYSES

All chemical analyses were performed at Radian's Austin facility. Radian's Austin laboratory participates in the EPA WP (Water Pollution) and WS (Water Supply) performance evaluation programs and took the lead for Radian in the EPA TCLP evaluation program.

In providing an analytical approach to the TCLP analyses, absolute consistency with EPA quality assurance protocols were maintainted. This required that:

- A method blank be prepared for each TCLP and EP Tox extraction batch;
- The method of standard additions be used on all EP Tox metals analyses;
- Volatile and semivolatile matrix spike and matrix spike duplicates be run for batch;

Radian analysed the RMA samples for TCLP constituents and EP Toxicity constituents following procedures outlined in (1) the proposed TCLP method printed in the Federal Register of June 13, 1986 and (2) Method SW1310 for EP Toxicity. Herbicides and pesticides were not included in this survey of compounds. Radian conformed to EPA SW846, Third Edition protocols for the laboratory analyses and QC criteria. Target compounds for this program were:

3.3.2 SAMPLE PREPARATION LABORATORY

Radian used twelve ZERO HEADSPACE extractors for TCLP volatiles extraction. Two of the extractors were used for method blanks, the other ten for actual analyses. In addition to zero headspace capacity, Radian also used rotary extractors sufficient for twenty simultaneous TCLP metals and semivolatile organic leaching operations. Radian's EP Toxicity leaching capability allows for the simultaneously leaching of 15 soils or wastes by EP Tox protocols.

The sample preparation laboratory consists of 3 rooms totaling 1500 square feet to provide 40 linear feet of hood space. With this hood space, the facility is equipped to run 50 continuous liquid-liquid extractions simultaneously. Each piece of equipment was thoroughly cleaned between each use to prevent contamination. Method blanks were used throughout the study to verify the integrity of these sample preparation procedures.

3.3.3 MASS SPECTORMETRY LABORATORY

Gas chromatography combined with mass spectrometry (GC/MS) employing EPA Methods SW8240 for the volatile compounds and SW8270 for the semivolatile constituents was used to identify the TCLP target chemicals. The characteristic retention times of compounds on a GC column provided presumptive evidence of their identity. This information in conjunction with mass spectra of the compounds obtained as they elute from the GC column yielded nearly unequivocal identification of the compounds.

The Austin GC/MS Laboratory occupies more than 1,200 square feet of laboratory space physically isolated from other Radian laboratories. The GC/MS lab maintains separate control of air temperature and humidity to prevent cross contamination of chemicals.

3.3.4 INORGANIC ANALYTICAL LABORATORY

Radian's Inorganic Analytical Laboratories provided analyses of metals, by atomic absorption spectrometers (three Perkin-Elmer 3030 AA and a Perkin-Elmer Model 403 AA), and Jarrel Ash 9000 and ARL 3400 Inductively Coupled Plasma Emission Spectrometer (ICPES). The two ICPES are capable of simultaneous analysis of the metals specified by EPA methods SW6010 and targeted by TCLP. The AAs were used for lead, mercury, and selenium analyses.

4.0 ADDITIONAL DATA

Radian Corporation is providing an associated document with this report which contains the following ancillary material:

1) Laboratory Reports - Includes analysis data, surrogate recoveries, matrix spike, matrix spike data, and preparation and anaysis histories;

2) Field Sample Information - Provides sample information and comments from the RMA participants; and

3) SW846 Methods and Proposed TCLP Protocols - Containing the EPA procedures for all tests performed as part of this study.

APPENDIX A

RADIAN
CORPORATION

An Example of A
Field Sampling Instruction Set for RMA Participants

Radian Corporation SAMPLING PROTOCOL

Revision 1 - 5/30/89
RUBBER LEACHATE INVESTIGATION

READ THESE INSTRUCTIONS CAREFULLY BEFORE COLLECTING SAMPLES.

QUESTIONS SHOULD BE DIRECTED TO

ROBERT RICHARDSON		PATRICK MEEHAN
PROGRAM MANAGER	or	CLIENT SERVICES REPRESENTATIVE
RADIAN CORPORATION		RADIAN CORPORATION
AUSTIN, TX		AUSTIN, TX

Telephone: 512 454-4797

I. INTRODUCTION

The purpose of this program is to determine the extent, if any, to which rubber products leach hazardous constituents when placed in a landfill.

Radian Corporation will require representative samples of various rubber products to test for the materials' leaching characteristics. This protocol is designed to provide instructions for you, as the representative manufacturer, to collect and ship these samples to our laboratory.

Accompanying this protocol is a sampling kit with containers, address labels, chain of custody forms, and shipping instructions. A form has also been provided for sample information (product definition - such as the date produced, lot number, composition). For purposes of confidentiality, all information concerning participants and their samples have been assigned a numeric code. The Radian primary client code identifying RMA for this project is Vulcan. You will find this code and appropriate numeric assignments on your chain-of-custody forms and sample labels. Do not write your company name or identify the RMA on the form, the container labels, or the address labels. Once the samples have been received at Radian, you will be contacted by the Client Services Coordinator to confirm sample identities and code assignments. The samples will then undergo EPA's Toxicity Characteristic Leaching Procedure (TCLP) and EPA's Extraction Procedure Toxicity Characteristic (EPTC or EP Tox). And finally, the leachates will be tested for organic and inorganic hazardous materials of interest to RMA membership.

II. SAMPLE INTEGRITY

Follow-on studies may be performed on the rubber products from which you are collecting these samples. Please store the products in an environment where they will not be exposed to oils or other chemicals, excessive humidity, temperature, or ozone for at least three months. RMA will provide guidance if longer term archival is required.

III. THE RADIAN SAMPLE KIT

The sampling kit consists of an insulated ice chest, one (1) prelabled 1-liter large mouth jar for each product sample undergoing an TCLP or an EPTC test, a prelabled chain-of-custody form (Attachment 1), packing materials, ice-packs (Blue Ice) for preservation during shipment, and prepared return address labels, and chain-of-custody seals to seal each container. You will also have a duplicate form for sample identification data (Attachment 2).

The 1-liter glass jar has been specially prepared to be free of organic materials. It is important that during handling, no object (including fingers) other than sample material be placed in the interior of the jar.

RADIAN CORPORATION

ATTACHMENT 2 **SAMPLE INFORMATION**

CODE ASSIGNMENT: VULCAN-__________ COLLECTED BY: __________

DATE PRODUCT WAS PRODUCED: __________ DATE COLLECTED: __________

....

A. SAMPLE IDENTIFICATION DATA:*

GENERAL DESCRIPTION (AUTOMOTIVE TIRE, BELT, ETC.) __________

DETAILED DESCRIPTION/NAME/MODEL NO: __________

LOT NUMBER OR OTHER UNIQUE IDENTIFIERS MARKINGS: __________

PRODUCT SIZE (VOLUME): __________ PRODUCT WEIGHT (LBS): __________

CHEMICAL COMPOSITION: __________

B. SAMPLE COLLECTION DATA:

BRIEFLY DESCRIBE YOUR PROCEDURES/APPROACH AND ANY DIFFICULTIES IN COLLECTING THE SAMPLE. __________

C. PROVIDE A SKETCH OF THE PRODUCT AND THE LOCATIONS FROM WHICH THE SAMPLE WAS COLLECTED. IF OTHER THAN A CROSS-SECTION WAS MADE, INDICATE WHY.

---

* We would appreciate your enclosing any additional (non-proprietary) printed material regarding this product's composition or usage, that is available.

RADIAN
CORPORATION
8501 Mo-Pac Blvd
P.O. Box 201088
Austin, TX 78720-1088

ATTACHMENT I

Chain of Custody Record

PROJECT

SITE

COLLECTOR

SAMPLE I.D.	TYPE	DATE/TIME	Analyses	REMARKS

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RECEIVED FOR LABORATORY BY:	DATE	TIME	REMARKS				

X 60g

Keep the jars closed until you are ready to add sample. Close them immediately after adding the sample.

For purposes of sample security, please retain a copy of the chain-of-custody form and the sample information form.

IV. INSTRUCTIONS

a) Lay out all the sample containers and supporting documentation. Each sample container is dedicated to a specific sample. If possible, about one liter volume of sample will be collected.

b) Freeze Radian provided Blue-Ice packs for 24 hours before use. If refrigeration is not available, secure a source of ice to be used in chilling the samples during shipment back to Radian. The ice should be carried in two ziplock bags, an inner bag and an outer bag. Leaking ice chests will be stopped by most shippers and the samples may become compromised. Several ice packs may be necessary to chill the samples.

c) Compare the coded sample labels with the code sheet provided in the sample kit. The labels will have a coded identification and the test to be performed. The code sheet should not be shipped back with the sample kit. It is for your reference. Radian program management will maintain two copies of the code sheet at their office.

d) Collecting representative samples - THIS IS A TEST OF THE PRODUCT...NOT JUST THE RUBBER MATERIAL IN THE PRODUCT...THEREFORE SAMPLES MUST BE COLLECTED WHICH ARE REPRESENTATIVE OF ALL OF THE PRODUCT'S CONSTITUENTS.

POWER TOOLS CREATE FRICTION WHICH CAN ALTER THE COMPOSITION OF THE SAMPLE. TAKE CARE TO KEEP HEAT AND CHEMICALS AWAY FROM THE PRODUCT BEING SAMPLED.

Instruction (e), below, provides information on general sampling size and weight requirements. For this program, it is extremely important that a sample be collected which is representative of the whole product. For homogenous samples or for regularly layered samples a cross section of the product will be representative.

For non-uniformly structured products samples must be collected which proportionately represent the entire product. For example, if a product has metal handles constituting 10% of the mass (by weight). Then 10% of the sample must be from the metal handles.

e) Collect the samples and fill the containers. If possible fill all containers to the neck of the bottle. For those samples designated for EPTC tests, attempt to provide material sized as large as possible (big pieces). Samples designated for TCLP will be shredded by Radian to less than 1 cm, therefore sample size is not a major consideration. At minimum we need the following sample sizes to allow for routine analysis as well as QC testing.

TCLP samples - 600 gms

EPTC samples - 300 gms

f) Keep the containers closed until you are ready to add the sample. After capping the containers, cover the neck and cap of each container with a custody seal in the fashion of the seal on a liquor bottle. Initial and date the custody seal. The custody seals will document tampering with the samples after collection.

g) Complete the chain-of-custody form by confirming the identity of each sample, adding the date and time of collection, the type of bottles, and the analyses to be performed. Conceivably, not enough sample may be available to fill the containers for all the analyses.

The chain-of-custody is an important document since it starts the chain of custody for the samples. Since this is a legal document, sign and date the form after completion.

Similarly fill out the Sample Information Form. Take care to provide all data which uniquely identifies the model and the product. Attach any other printed materials that may be available describing the product.

Keep a copy of the Sample Information form and the Chain-of-custody form. Send the original with the sample kit.

g) Carefully pack the samples in the ice chest for return to Radian. Separate the containers as well as possible within the chest and put packing material between them. Place sufficient ice or Blue Ice to keep the samples chilled during shipment.

h) Seal the ice chest with tape and place two custody seals across the lid and face of the ice chest. One seal should be across the front and a second seal on the side. Initial and date each seal.

i) Return the samples to Radian via an overnight delivery service (e.g., Federal Express). The samples should be sent to:

Radian Corporation
5101 West Beloit Rd
Milwaukee, WI 53214

ATTN: Chuck Applegate

Pre-addressed return labels will be included with the sample containers.

j) If questions arise concerning these instructions, shipment, preservation, or any other issue surrounding collection of the samples, contact:

Robert Richardson, (512)-454-4797,
extension 5615 or

Pat Meehan, (512)-454-4797, extension 5159.

ATTACHMENT 2

DRAFT MODEL STATE LEGISLATION

RMA
RUBBER MANUFACTURERS ASSOCIATION
1400 K STREET, N.W. • WASHINGTON, D.C. 20005 • (202) 682-4800

Outline for "Model" Scrap Tire Legislation

(8/4/88)

Sec. I. Statement of legislative findings and declarations

Sec. II. Study/Report

Authorize study to examine following areas; study to be completed 6 months prior to the effective date of provisions in subsequent sections.

A. Number and geographical distribution of waste tires generated

B. Location and size of existing tire dumps

C. Location of existing collection sites

D. Financial responsibility requirements necessary for processors, collectors, haulers

E. Alternative methods of collecting waste tires

F. Options for waste tire recycling, current use, future feasibility

G. Methods to establish reliable sources of waste tires for waste tire users

H. Types (and location) of facilities in State that can utilize waste tires as fuel source

1. cost of equipment modification required

2. cost of test burns

3. feasibility of operating each facility using waste tires as fuel source

Sec. III. Definitions

A. Department/Commission/Agency as appropriate

B. Waste Tire

A tire that is no longer suitable for its original intended purpose because of wear, damage, or defect.

C. Tire Collector

A person who owns or operates a site used for the storage, collection, or deposit of more than 50 waste tires.

D. Collection Site

A permitted site, or a site exempted from permit, used for the storage of waste tires.

E. Tire Processor

A person engaged in the processing of waste tires.

F. Processing Site

A permitted site used to produce or manufacture usable materials (including fuel) from waste tires.

G. Tire Dump

An establishment, site, or place of business without a collector or processor permit that is maintained, operated or used or allowed to be used for the disposal, storing, or depositing of unprocessed waste tires.

H. Tire Hauler/Carrier

A person engaged in picking up or transporting waste tires for the purpose of storage or disposal.

Sec. IV. General prohibition against disposing of waste tires except at permitted processing or collection sites

Sec. V. Permit Requirement

A. Required of all Collectors, Processors, Haulers on or after effective date.

B. Preexisting Tire Dumps

Require all owner/operators of tire dumps in existence on effective date to either be in compliance with this law or cease operations at facility and permanently dispose of all waste tires at the facility within one year of effective date.

C. Exemptions

1. tire retailers with less than 500 waste tires
2. tire retreaders with less than 2500 waste tires
3. businesses which remove tires from vehicles with less than 500 waste tires
4. permitted Solid Waste facilities with less than 2500 waste tires
5. person using waste tires for agricultural purposes

Sec. VI. Powers/Duties of Secretary/Commissioner/Administrator

A. Promulgate appropriate rules and regulations including waste tire collector, processor and hauler permits; collection and processing facilities; tire dump (nuisance) abatement

B. Provide technical assistance to local governments and others engaged in processing of waste tires

C. Cooperate with federal, interstate, state, local agencies in promoting operation of processing facilities in safe, sanitary, efficient, environmentally sound manner

Sec. VII. Tire Collection and Processing Facility Requirements

A. Facilities containing up to 2500 waste tires

1. only tires to be accumulated in designated area

2. piles to be no more than 15 ft. high, 40 ft. wide, 200 ft. long

3. minimum separation of 20 ft. between piles, and kept clear

4. piles to be at least 30 ft. from perimeter of property and 60 ft. from any buildings

5. piles to be maintained to limit mosquito breeding by such means as:

   a. covering with plastic

   b. chemically treating

   c. shredding

6. piles to be accessible to fire fighting equipment

7. Collector/Processor must provide acceptable financial security to cover cost of removal.

B. Facilities containing more than 2500 tires: All of the above, plus

1. area to be completely enclosed by fencing

2. establish dirt berm at the perimeter

3. provide appropriate drainage

4. approach road to be maintained in good condition and passable by fire-fighting equipment

5. storage area to be kept clean of weeds and other vegetation

6. appropriate emergency procedure plan in effect

Sec. VIII. Waste Tire Fund

A. Moneys raised by "user fee" selected so as to provide minimum interference with orderly marketing of tires (i.e., add-on to vehicle registration or title transfer fee)

B. Moneys collected to be controlled by Department/Agency/Commission responsible for other provisions of this act.

C. Moneys collected to be dedicated for scrap tire disposal purposes.

D. Funding mechanism to sunset after 5 years.

Sec. IX. Loans and Grants

Alternatives for use of moneys in Waste Tire Fund:

A. Fund assistance to local governments to

1. abate tire dumps

2. establish tire collection/processing facilities

3. eliminate health and safety hazards of dumps

4. permanently dispose of waste tires within those jurisdictions

B. Fund capital and operating expenses of waste tire processors that are related to resource recovering; considering

1. geographic distribution of $

2. demonstration by applicant that land, buildings, support services are committed to tire resource recovery

3. feasibility study from applicant showing positive justification

4. likelihood of success

C. Fund loans to owners of storage/processing facilities to comply with requirements of law; considering

1. number of tires at facility

2. method of volume reduction to be used

3. threat to public health/environment/nuisance

4. location

5. whether recycling involved

D. Fund research and marketing projects designed to enhance tire resource recovery, considering

1. whether project has measurable objectives

2. type and extent of follow-up/evaluation to be conducted

3. likelihood project would result in feasible new technology

Sec. X. Evaluation of Grant and Loan Programs

Require periodic review and audit of grant and loan programs to evaluate the extent to which they have contributed to the objectives of this act.

Sec. XI. Criminal/Civil Penalties for Non-Compliance

Sec. XII. Preemption

Enactment of this legislation to preempt local ordinances.

Senator WIRTH. Mr. Serumgard, I thank you for that very conciliatory statement. We look forward to working with you and seeing if we can sort out the problems which you have identified. I have a couple of questions that I want to come back to you on.

Dr. Marker.

STATEMENT OF DR. GORDON A. MARKER, EXECUTIVE VICE PRESIDENT, OXFORD ENERGY CO.

Dr. MARKER. Mr. Chairman, Oxford Energy wishes to thank you for the opportunity to present its testimony today. Our focus will be on those aspects of the legislation that relate to scrap tire utilization and the proposed recycling credit system.

Since Oxford Energy originated in 1985, we have established a leadership position in our industry and have received awards from the U.S. Department of Energy and the State of California for our work in the environment and energy innovation.

Oxford's first tire-to-energy plant has been operating for nearly 3 years near Modesto, California, and disposes of 4.5 million tires annually. The energy captured from these scrap tires is converted to steam, powering a turbine generator for electricity customers in Northern California.

The second plant is under construction in Connecticut which will transform 10 million scrap tires annually into usable electricity beginning about a year from now. This is enough to provide the needs of approximately 30,000 households. Other plants in development are: Nevada, which will deal with the Southern California scrap tire supply; Western New York; and the Midwest. Oxford projects that by 1995 it will be processing over 70 million tires per year from its integrated energy recovery and recycling operation.

It needs to be understood that energy production is only one of several byproducts of the Oxford system. In the published testimony there is a table that summarizes that. I will not go into detail.

The power plant with its long-term power sales contract is the anchor that allows the company to branch out and support higher end scrap tire recycling processes whose prices fluctuate with the spot market. Approximately 10 percent of the tires collected by Oxford are recycled as casings for the retreading industry or as used tires in the world market. Oxford will expand this and other tire recycling activities in the near future. The entity that allows the more volatile forms of recycling to flourish, however, is the existence of the tire-to-energy plants.

Because we are a major participant in the tire recycling and recovery business, we have a particular interest in this legislation. Let us now turn to the proposed legislation. On balance, Oxford strongly supports the national approach to standardize the treatment of waste tires. Too frequently, advantage is taken of differences in individual State laws and regulations that have the effect of compounding rather than solving a serious disposal problem.

We see as a consequence of this bill the establishment of national standards which will have the effect of significantly reducing illegal dumping. We applaud the legislative intent.

We also applaud the creation of an interagency task force and periodic evaluation of the balance between recycling, energy recovery and environmental consideration. Since this legislation will in effect create a new industry, the recovery credit industry, I will combine the balance of my remarks to problems that I foresee in the legislation which can perhaps be easily remedied.

Does the legislation create a level playing field? We would respectfully suggest that the proposed mechanism indeed creates the opposite of what may be intended. The fundamental flaw in the approach is the creation of a very unlevel playing field for tire-to-energy facilities.

First, the value of using tires as fuel is not fully acknowledged in the credit system. It needs to be pointed out that the treatment of tires as an energy supply is in marked contrast to that accorded wastepaper also in this legislation. It appears that wastepaper is acceptable as a fuel without penalty in wastepaper incineration. It would seem to me that the same logic should apply to tire-to-energy facilities. We suggest that tires to energy be afforded full credit.

Second, there is a distinct bias as to what is entitled to a full credit under the recovery credit system. This bias does not appear to have anything to do with the hierarchy of disposal alternatives.

I call your attention to classification number 5, where one credit is given for one whole tire reused or recovered through approved uses of retreading, use as reclaimed rubber or in road pavings, asphalt. The legislation discriminates against one of the more innovative potential methods of dealing with large amounts of rubber, as, for example, in the manufacture of railroad crossing mats.

I see that the light is on.

Why should that use be penalized one-fourth credit as opposed to asphalt applications?

The credit mechanism itself is a bit problematic. If the presumption is that the existence of a credit system is going to lead to new investments dedicated to the removal of waste tires, I think that is quite optimistic.

Just to summarize this next paragraph, there has to be a price that one uses, and it would seem to me that with no price in the credit system postulated it is unlikely that you are going to achieve one of the goals, which is the removal of large tire piles. There is more on that in the published testimony.

As to conclusions, Oxford believes that there is ample room among diverse technologies for each of its individual contributions to the waste tire disposal problem. With 2 to 3 billion scrap tires piled around the U.S. landscape plus an annual augmentation of at least 250 million, it would seem there is no need to make speculative judgments as to the best means of disposal.

All the uses and transformations should be treated equally from the outset. Tires to energy is the most rapid large-scale alternative among existing technologies. The role of tires to energy should not be relegated to a rear seat. It is the ultimate disposal means, for example, of the remnants of tires whose rubber has been peeled for rubber-asphalt applications. It is certainly an alternative superior to landfilling, and the scrap metal remaining on the grates and the fly ash and scrubber waste all have markets.

Finally, energy recovery from tires is a proven technology capable of making an immediate dent in a severe national problem. As an energy resource alone, scrap tires should be accorded parity with more traditional forms of recycling. The United States' largest single element in our import deficit on current account is energy. This has been accelerating in recent years.

It behooves the Senate Energy Committee, therefore, to encourage the capture of 4 billion gallons of equivalent number 2 fuel oil scattered in piles throughout America. Correspondingly, if only 50 percent of the annual growth in our tire discards were available for energy transformation, then the energy from 312 million gallons of imported oil could be avoided each year. We think these are worthy goals for the subcommittee.

On the regulatory front, Oxford supports the national perspective for dealing with the scrap tire problem. It is important that there be national leadership and consistency, which this bill provides.

The implementation of the credit system is not altogether evenhanded and for importers overly complex. The concept of the credit system should be refined. We would suggest the formation of a special task force drawn from the entire spectrum of the tire and rubber industry embracing manufacturers as well as representatives of proven recycling and energy recovery technologies.

Finally, certainly modifications to the definitions need to be made. These are part of the appended materials.

Again, we thank you for our opportunity to participate to share our views. We welcome the leadership of the U.S. Senate in this national challenge.

[The prepared statement of Dr. Marker follows:]

PREPARED STATEMENT OF GORDON A. MARKER, EXECUTIVE VICE PRESIDENT, THE OXFORD ENERGY COMPANY

Mr. Chairman and Members of the Subcommittee, Oxford Energy wishes to thank you for the opportunity to present its testimony today. Our focus in the Title III Amendment is on those aspects related to scrap tire utilization and the proposed recycling credit system.

My name is Gordon A. Marker and I am an Executive Vice President of The Oxford Energy Company. Oxford Energy is a publicly held company, trading on the American Stock Exchange, whose principal focus is in the recycling and conversion of scrap tires. Since our origin in 1985, we have established a leadership position in our industry and have received awards from US Department of Energy, and the State of California for excellence in environment and energy innovation.

Oxford's first tire-to-energy facility has been operating for nearly three years near Modesto, California and disposes of 4.5 million tires annually. The energy captured from these scrap tires is converted to steam, powering a turbine generator for electricity customers in northern California. A second plant is under construction in Sterling, Connecticut, which will transform 10 million scrap tires a year into usable electricity, beginning around mid 1991. This is enough to provide the needs of approximately 30,000 households. Other plants in development are in Nevada (which will also deal with southern California's scrap tire supply), western New York and the Midwest. Oxford projects that by 1995 it will be processing over 70 million tires a year from its integrated energy recovery and recycling operations.

It needs to be understood that energy production is only one of several by-products of the Oxford system. Table 1 summarizes Oxford's current and projected scrap tire activities through 1995. The power plant - with its long-term power sales contract - is the anchor that allows the Company to branch out and support higher-end, scrap tire recycling processes whose prices fluctuate with the spot market. Approximately 10% of the tires collected by Oxford are recycled as casings for the retreading industry or as used tires in the world market. Oxford will be expanding this and other tire recycling activities in the near future. However, the entity that allows the more volatile forms of recycling to flourish is the existence of the tire-to-energy plants. Because we are a major participant in the tire recycling and recovery business, we have a particular interest in the legislation before your subcommittee today.

TABLE 1

OXFORD ACTIVITIES: SUMMARY AND PROJECTIONS BY SECTOR
(millions of passenger tire equivalents)

ACTIVITY	'88	'89	'90	'91	'92	'93	'94	'95
Casings/Used Tires	0.3	0.4	1.0	2.3	2.9	5.7	7.9	10.2
Tire-Derived Products	0.3	0.1	0.2	2.0	3.5	5.1	6.6	8.2
Tire-Derived Fuel	1.4	1.3	2.3	8.5	8.5	10.3	10.3	12.1
Dedicated Power Plants	3.4	3.7	4.5	14.5	14.5	39.5	49.5	59.5
TOTAL	5.4	5.5	8.0	27.3	29.4	60.6	74.3	89.9

Let us now turn to the proposed legislation. On balance, Oxford strongly supports the national approach to standardize the treatment of waste tires. Too frequently advantage is taken of differences in individual state laws and regulations that has the effect of compounding, rather that solving, a serious disposal problem. We see, as a consequence of this bill, the establishment of national standards which will have the effect of significantly reducing illegal dumping. We applaud this legislative intent.

We also applaud the creation of an interagency task force and periodic evaluation of the balance between recycling, energy recovery and environmental considerations.

Since this legislation will, in effect, create a new industry -- the recovery credit industry -- I will confine the balance of my remarks to problems that I foresee in the legislation which can perhaps be easily remedied.

Does the legislation create a level playing field?

We would respectfully suggest that the proposed mechanism indeed creates the opposite of what may be intended. A fundamental flaw in the approach is the creation of a very unlevel playing field for tire-to-energy facilities. First, the value of using tires as fuel is not fully acknowledged in the credit system. It needs to be pointed out that the treatment of tires as an energy supply is in marked contrast to that accorded waste paper, also in this legislation. It appears that waste paper is acceptable as a fuel and without penalty in waste paper incineration. It would seem to me that the same logic should apply to tire-to-energy facilities. We suggest that tires-to-energy be afforded full credit, co-equal with crumb rubber.

Secondly, there is a distinct bias as to what is entitled to a full credit under the recovery credit system, and this bias does not appear to have anything to do with the hierarchy of disposal alternatives.

I call your attention to Classification #5 where one credit is given for "one whole tire reused or recovered" through approved uses of retreading, use of reclaimed rubber in new tire production or asphalt road paving mix. The legislation discriminates against one of the more innovative potential methods of dealing with large amounts of crumb rubber, as for example, in the manufacturing of railroad crossing mats. The companies in this application utilize large amounts of crumb rubber in remolded products for a specific recycling application. The process involves preparation of small rubber particles, either through shredding or crumbing or a combination. Since the objective of the legislation is to encourage beneficial reuse of the waste stream, one would be hard pressed to demonstrate how using a substitute for asphalt in road making is socially more advantageous than molded rubber products for railroad crossing materials. Why should the latter be penalized in the credit system by a one-fourth credit reduction as compared to asphalt applications?

Efficacy of the Recovery Credit System.

The credit mechanism is itself a bit problematic. If the presumption is that the existence of a credit system is going to lead to new investments dedicated to the removal of waste tire piles, for example, I think that is quite optimistic. First, there is no initial price at which the credits are valued. Assuming that a $1 million investment is required for a comprehensive shredding operation and the throughput is 4 million tires/year, the operator would receive 1 million credit points under the proposed system. If the objective is to deal with tire piles as a priority, then the credits would have to have a value equal to not less than 25 cents in order to cover the capital charge against such a facility. Where there is no equilibrium price at the outset in a new and untested industry, it is unlikely that the credit system will encourage shredding for tire pile removal in the absence of the other economic forces that would give a positive value to that activity. Judging from what is happening at the state level, it would appear that the incentive in the range of 50 cents-$1.00 is necessary to effect tire pile removal. But on its own, it is unlikely that the credit system would, itself, initiate the substantial investment in shredding equipment and subsequent tire pile reduction without an initial value assigned to recovery credits.

It appears that the provision is addressed equally to manufacturers as well as to importers. We would suggest that the scores of small tire importers that run substantial tire businesses will be needlessly burdened by the accounting provision of this section. Rather, it would be more appropriate for the suppliers to the importers, through their principal subsidiaries in the United States, comply with the reporting provisions, rather than small tire import companies.

CONCLUSIONS

Oxford Energy believes that there is ample room among diverse technologies for each to make its individual contribution to the waste tire disposal problem. With 2-3 billion scrap tires piled around the United States landscape, plus an annual augmentation of at least 250 million, it would seem there is no need to make speculative judgments as to best means of disposal. All reuses and transformations should be treated equally from the outset.

Tires-to-energy is the most rapid, large-scale alternative among existing technologies. The role of tires-to-energy should not be relegated to a rear seat. It is the ultimate disposal means, for example, of the remnants of tires whose rubber has been peeled for rubber asphalt applications. It is certainly an alternative superior to landfilling. And the scrap metal remaining on the grates and the flyash and scrubber wastes have markets, respectively, in cement, zinc and agriculture industries. Finally, energy recovery from tires is a proven technology, capable of making an immediate dent in a severe national problem. The markets are established and offer long-term stability.

Viewed as an energy resource alone, scrap tires should be accorded parity with more traditional recycling. The United States' largest single element in our import deficit on current account is energy. This has been accelerating in recent years.

Therefore, it behooves the Senate Energy Committee to encourage the capturing of 4 billion gallons of equivalent number two fuel oil scattered in piles throughout America. Equally, if only fifty percent of the annual growth in our tire discards (125 million tires) were available for energy transformation, then the energy from 312,000,000 gallons of imported oil could be avoided each year. Oxford thinks these are worthy goals for Subcommittee on Energy Regulation and Conservation. On the regulatory front, Oxford supports the national perspective for dealing with the scrap tire problem. It is important for there to be national leadership and consistency which this bill provides.

The implementation of the credit system is not altogether even handed and, for importers, overly complex. For manufacturers, the assumption that large amounts of secondary rubber particles can be used in new tires is probably not correct.

The concept of the credit system should be refined. We would suggest the formation of a special taskforce drawn from the entire spectrum of the tire and rubber industry, embracing manufacturers as well as representative of proven recycling and energy recovery technologies.

Finally, as noted in the Annex, certain modifications to the section on definitions appear to be need attention to make them more inclusive.

Again The Oxford Energy Company thanks the Subcommittee for the opportunity to share its views on positive and comprehensive scrap tire management.

We welcome the leadership of the U.S. Senate in this national challenge.

ANNEX

APPENDED NOTES ON DEFINITIONS

For Section 202, Part B, where a number of definition additions have been made with regards to waste tires, we suggest the following changes;

1. The term "shredded tires" is too restrictive as it has been used where only a two-inch square chip fits that definition. It should be pointed out that larger chips are more readily and cheaply available and have much the same energy value. We would suggest that the shredded tire definition include shedding which reduces the volume of the whole tire by at least 50%.

2. Tire derived fuel which requires that 95% of the metal be removed is also too needlessly restrictive. It is quite possible to utilize larger pieces with steel still imbedded at a much lower fuel preparation cost and still provide much the same energy as smaller two-inch square chips.

Senator **Wirth**. Dr. Marker, thank you very much. It was very good testimony. We appreciate it.

Mr. Rouse.

STATEMENT OF MICHAEL WM. ROUSE, PRESIDENT, ROUSE RUBBER INDUSTRIES, INC.

Mr. **Rouse**. Mr. Chairman, thank you for the opportunity to present my views at this hearing. As a recycler, major scrap rubber processor and an engineer involved in energy and recycling activities for over 25 years, I believe that recycling will preserve our resources, protect our environment ad become a major factor in reducing our dependency on imported oil.

Scrap rubber recycling has played a major, vital and essential role in America's development and security for over 140 years. In 1939, Charles Goodyear discovered vulcanization and opened up a new area of opportunities for a growing America. The impact of this discovery resulted in the following list of rubber products which were listed in the 1860 United States Census of Manufacturing: elastic rings, hose, coats, capes, ponchos, all the way down to such items as caps, mittens, gloves, and shoes.

Recycling of rubber goods became very fashionable in the 1850's and has continued to the present time. The graph that is included in my presentation, the historical consumption of new and reclaimed rubber, illustrates the use of reclaimed rubber in relation to virgin rubber from 1850 to 1950.

Rubber recycling has played a key role in preserving our precious resources. This role must continue to meet the growing and expected demands. Rubber recycling activities carried America through two major world wars. It has been one of the oldest recyclable commodities in America's growth. The proven success of rubber recycling is now part of our heritage.

In the 1970's and 1980's, America saw the number of rubber reclaiming plants drastically fall from 32 to 2. The closure of these plants was mainly due to the availability of cheap oil, tire recycling falling out of favor, the advent of the radial tire, and tire companies building their own synthetic rubber plants. These were the major reasons why America saw an estimated 3 to 5 billion tires suddenly accumulate across its landscapes in the last 3 decades.

By contrast, Europe and Asia do not have a scrap tire problem. They view these tires as a resource for new tire manufacturing, molded goods, athletic surfaces, road applications, and energy recovery. These countries value their resources. Their actions are reflected in the recovery of their waste materials to displace dependence on imported oil and preserve their own resources.

The proposed amendment to the Resource Recovery and Energy Conservation Act is the first major step in America moving forward to preserve its resources.

Today, over 240 million tires are generated, of which 36 to 48 million tires are presently recycled for a wide variety of applications. The challenge is to utilize these tires to their highest and best use in an environmentally safe and economic manner.

Two applications that meet these criteria and can absorb tires are new tire manufacturing and rubberized asphalt. This will result in the remaining 167 million scrap tires being utilized. These applications provide for maximizing energy and material recovery for the present and the future.

Based on a study conducted by the Department of Energy in 1979, approximately 90,000 Btu's are required to produce a pound of rubber in a new tire. The study also states that energy savings of 34,000 Btu's can be obtained with conventional tire reclaims.

Recent commercial advances in the development of superfine tire rubber and high strength reclaims are resulting in increased potential energy savings to 80,000 Btu's per pound of recycled rubber. With these new developments, a 6.5 percent substitution will result in the recovery of 31 million scrap tires generated annually without affecting the integrity and the safety of the new tire.

Major tire manufacturers are evaluating and using these new reclaims in several tire compounds. The outlook is optimistic towards the future and increased incorporation of high quality recycled rubber in their products. This substitution alone would result in energy saving of 4 million barrels annually. The challenge to the tire manufacturers is to evaluate and test these new products available today.

The Department of Energy also refers to the application of tire rubber in highway construction could result in an energy savings of 90,000 Btu's per pound. This application not only saves energy but improves road ride and adds many other desirable benefits. The National Asphalt Paving Association estimates 480 to 500 million tons of asphalt cement is produced annually. In pavement designs, this would result in utilizing 441 million scrap tires annually. Scrap tires for modified asphalt would result in an energy savings of 63 million barrels of oil annually.

The challenge to our highway administrators is to progress in developing standard rubberized pavement designs and take advantage of this valuable and needed resource. If action is taken and technology is utilized, an average of 404 million scrap tires will be required to meet the existing and new demands of tire manufacturing and rubberized asphalt. Recycling can be the mechanism to recover the embodied energy in scrap rubber and result in an actual savings annually of 69 million barrels of oil. The resulting 224 million scrap tires can now be used to clean up the unsightly and potentially dangerous tire piles across America.

On top of taking the 224 million tires off the existing tire piles from these two uses, tire manufacturing and rubberized asphalts, this does not begin to say how fast we can take away the tire piles with energy recovery.

Preserving our national resources in America must be our top priority. Incentives and action must prevail to move forward and recapture our valuable resources in a timely and effective manner. Over the past several decades we have seen many of our recycled materials exported and then imported back to America as a finished product. Commitment by Government and industry through participation with legislation can be the catalyst in assuring that such a valuable commodity as scrap tire rubber can once again be cast into its designated position as a strategic resource.

The legislation now being proposed by Senator Wirth and similar legislation introduced by Congressman Torres does not force but rewards the American entrepreneurial spirit. Those who want to take part in transforming scrap tires into a viable national resource will have the incentive to do so. Yet, legislation must insure that the integrity of new tires produced for our highways is not compromised.

Americans look for leadership through the actions of our elected officials. The proposed legislation will provide the initiative and the incentives to promote energy efficiency and conserve valuable national resources through the use of waste and recoverable materials. The technologies are in place, the opportunities abundant, the cooperation, the willingness and the potential to move ahead in developing these recycling applications is the responsibility of all. Action, not rhetoric, is required to preserve this viable resource in an environmentally sound manner.

Thank you very much.

Senator Wirth. Thank you very much, Mr. Rouse. I appreciate your testimony.

Let me start with you, Mr. Serumgard. Was your predecessor Donald Brotzman, or are you a different organization?

Mr. Serumgard. Yes. Well, no, it is the same organization. Mr. Brotzman was the president up until last year.

Senator Wirth. You are the president now?

Mr. Serumgard. No. I am the vice president of the Tire Division.

Senator Wirth. Who is the president now?

Mr. Serumgard. Tom Cole, who was the vice president of the Tire Division up until last year.

Senator Wirth. I have it.

Let me ask you. Mr. Bono has testified very eloquently, and the record of Palm Springs is one that is very impressive.

I might say, Mr. Bono, that the airport in my hometown of Boulder, Colorado is a major user of rubber-asphalt.

Why do you think, Mr. Serumgard, that Palm Springs is able to recycle an amount of tires equal to that of almost all of the rest of California put together? Why are they successful and other cities are not?

Mr. Serumgard. I suspect because they have had the willingness to take a look at it seriously and to realize the value that it brings to the project. Frankly, I think there is some resistance in the highway community. There is some resistance in the asphalt paving community.

Senator Wirth. Have you all picked up the example of Mr. Bono in Palm Springs and attempted to market that to the highway community or to the asphalt community or to other cities?

Mr. Serumgard. The Asphalt-Rubber Producers Group out of Phoenix does a very good job of promoting that. We indeed do promote rubberized asphalt as one of the solutions——

Senator Wirth. Have you promoted to any other communities what Mr. Bono has done or any examples of this to other cities around the country?

Mr. Serumgard. Not specifically with Palm Springs.

Senator Wirth. Again, if we want to stay away from the heavy hand of Government regulation and all of that rhetorical thing, would it not be a good idea to take good examples and——

Mr. SERUMGARD. Yes. We do. In fact, as we note in our written testimony, we think that there has been a range of developmental projects across the States in numerous States. We think that the time for continuing to study the problem and run the developmental tests may in fact be passed and that what we really need to do with asphalt-rubber is to do some evaluation of all those tests and get on with the business, really, of promoting the use of rubberized asphalt.

I think Texas is another example of a State that makes significant use of rubberized asphalt. Phoenix is a city that makes extensive use of rubberized asphalt. There have been developmental tests and applications from Concord, Massachusetts to Alaska that have shown that it works.

Senator WIRTH. If in fact, then, there is a market that is growing out there and there is an energy market that Dr. Marker testified to very eloquently and other uses that Mr. Rouse is speaking to, why is it that a 5 percent increase per year is unrealistic? Did you testify that the 5 percent increase was realistic?

Mr. SERUMGARD. Yes. Well, these things are not necessarily on a level keel. That is to say, it is not necessarily an even line on a graph. Mr. Marker's company promotes and brings onto line a new project that consumes 10 million new tires. Now that is a step in the progression. It is not necessarily nice smooth line in the progression.

Senator WIRTH. So if you had 25 percent over 5 years, that would be all right?

Mr. SERUMGARD. Well, I am not sure whether any specific numbers would——

Senator WIRTH. Maybe you could give us a sense as to why 5 percent is unrealistic.

What strikes me is that the world is changing very dramatically and that what we have to do is to do everything we can to encourage everybody to change along with it. I know any organization such as yours is not dissimilar from this institution. You sort of tend to play to a lowest common denominator, and getting people to change is hard to do.

Now what we want to do is to try to increase that. I would hope that we would get beyond the well, 5 percent or 4 percent or 2 percent or whatever. It seems to me that the world is changing so rapidly on landfill, so rapidly on the energy question, so rapidly on a number of things that 5 percent may well be low over the next 5 years or 8 years.

Mr. SERUMGARD. I think the real question, Senator, goes back to our perceived utility of the credit system itself. Whether 5 percent per year or any number per year is or is not an appropriate number really is the next step beyond the question of whether the credit system is a system that indeed has utility.

Senator WIRTH. So the criticism of 5 percent is really a way of getting at saying we should have no kind of a credit system?

Mr. SERUMGARD. We should not have a credit system.

Senator WIRTH. Well, then you ought to just come out and say that. That is okay.

Let me ask you by the State-by-State issue, Dr. Marker. What was your reaction to Mr. Serumgard's testimony? His written testimony came out pretty strongly on the fact that there should be no national standard but that it should be done on a State-by-State basis.

Dr. **Marker**. Well, Oxford and the RMA do not necessarily always agree.

We need a national tire disposal standard. We need a mechanism whereby there is going to be no incentive for tires in one State to be dumped in another State in a ravine, and we know that happens. We feel if there is an administrative mechanism which is not in the latest bill, I think as was pointed out, but has been in previous pieces of it, if there is an administrative mechanism that addresses sensible tire management on a national level, I think that is a very strong step in the right direction quite independent of the viability of the credit system.

Senator **Wirth**. What is your response to the State versus Federal system, Mr. Rouse?

Mr. **Rouse**. I think that the Federal Government really has to give you some guidance. America is a big country, and it is becoming very global in its responses. I think what we have to do is look to Washington sometimes to help coordinate these things and give guidelines. I think it really helps the other States. I think you can really follow the Clean Water Act. You can think of the environmental considerations.

When you have a perspective and a goal to look toward, I think it is very essential that sometimes these outlines are done. It is no different than writing specs for rubberized asphalt and cements burning various fuels. If we have a focus on where to look, what the guidelines are, then I think then it is going to be up to the initiative of the various locales and States to implement what they think is best for their community.

I think it is really important that we have some focus, a national focus, of what we want and where we are going no matter what endeavor we do.

Senator **Wirth**. How would you respond to that, Mr. Serumgard?

Mr. **Serumgard**. Thank you. It was your comment to the initial witness that our testimony with respect to State to State concluded that we, therefore, opposed Federal standards. In point of fact, we do not. We note that Congressman Luken in his RCRA reauthorization bill on the other side has in fact proposed that the States be mandated through their solid waste management plans to include handling the coverage of special waste, including tires, and he has in that proposed standards for the management of waste tires.

We have in our testimony before Congressman Torres' committee supported those provisions of the Luken bill. Indeed, we supported those provisions of Representative Torres' bill. We noted here, quite frankly, that this legislation does not include those same management standards. That deals with such issues as regulation of scrap tire haulers, regulation of the disposal sites, and prohibition of disposal of tires except in conjunction with those standards.

So we do not oppose the development of a set of model standards however they are proposed to the States, through RCRA or however, that deal with the problem of management of waste tires. We certainly at this stage would not fall back and say each State must do that independently. We recognize that there is a role for the

Federal Government to either impose or require through RCRA that the States adopt a State tire management plan.

Senator WIRTH. As a mayor, Mr. Bono, do you have any reaction to this debate on the Federal-State-local set of requirements?

Mr. BONO. Yes, I do, Mr. Chairman. I would say at this point and in the 1990's it is important that information be disseminated at every level, at a State level, at a Federal level, and at a local level.

Furthermore, it is essential that we include the use of promotion. I think promotion is essential for all of us and through a promotion to try to make some type of positive statement.

Palm Springs now uses cogeneration, wind energy, asphalt-rubber. When I was mayor, our city was in deficit $2 million 2 years ago. Due to some of these uses, our city is in the black plus $2 million now. If these facts were known and disseminated and examples were made, people would hop on that bandwagon.

I think the notion that the manufacturer should disseminate or any certain party should disseminate is not looking at the big picture. The big picture is we all have to send out the message that our materials are going away, that soon we will not have them, and that we have to look at the alternatives today for the future of our children tomorrow.

I, as a mayor, am happy to promote these ecological, progressive, innovative ways of using old materials and turning them into extra dollars for us and getting all the benefits. It can be done. It just has to start getting to be known. I do agree that the Federal Government is our leader. The Federal Government has the biggest voice in America, and it is important that they speak first and let us know what is to come. Again, I congratulate this committee in taking that step forward. I am sure the information from this panel will get out and get disseminated.

Senator WIRTH. We are working on it.

Dr. Marker, let me ask you a final question on the credit system. Would you suggest that there be a single credit system in which all uses for recycled tires be treated the same way? Would that get over the problem you are suggesting?

Dr. MARKER. Well, if your objective is to have maximum impact on disposal of existing stocks—i.e., the millions and billions of tires out there—and you do not want them to accumulate in the future—i.e., you have to deal with them on an annual basis—then why not make them all equal? I do not think the risks are great.

Senator WIRTH. Mr. Rouse, do you have any reaction to that?

Mr. ROUSE. Well, I think as you go up the hierarchy of trying to recycle—and Dr. Marker has already said 10 percent of his tires are recycled for reuse. He is already at the top part of his credits. For the other people who make very sophisticated type rubbers and it is recompounded in, the capital investments and the initiative are much more staggering.

I do believe by looking at the bill as presented that there should be a level of hierarchy because it really lets us focus on where are the best values.

In my testimony the idea that if you can reuse rubber for highways and new tires, you are getting the maximum value for that rubber—if it takes 90,000 Btu's from the original conception of pulling that oil out of the ground and putting it finally into the molded product of a tire and you can recapture that 90,000 Btu's most efficiently, to me that person or that process should be rewarded appropriately. The tire companies stand to gain the most by this and the States stand to gain the most by this because they can put it back in the roads. Also, there are many other residues that can be burned.

I think that the system of hierarchy will prevail. If there is another national energy crisis, you are going to find a lot of these materials floating up to the higher levels just because you have to have them. So I would say that the hierarchy system being leveled out here is fair and appropriate.

Senator **Wirth**. Let us assume that there is a credit system. Maybe that is a big leap of faith, but if there were such a thing how would you referee the discussion here between Dr. Marker and Mr. Rouse, Mr. Serumgard?

Mr. **Serumgard**. I think the question of whether or not there ought to be a hierarchy is driven by other considerations than whether or not we ought to get rid of scrap tires. It is driven by preexisting notions of whether or not there are higher and better uses of scrap tires than those which are most capable of solving the volume problem. After all, we are dealing with big numbers.

The asphalt paving industry, as broad as it is, consumes admittedly around 2 million tires a year. That is not a large number. A single cement kiln will consume 2 million tires a year. So if we look at it in that context, the ability quickly to increase the disposal of tires and to develop an infrastructure that will consume 240 million tires a year dispersed all throughout the country, the best technology for that is energy recovery in a wide variety of applications.

To suggest somehow we are going to sit around and skew the system toward some preferred higher use by use of credits seems to me to suggest that there is another agenda other than getting rid of scrap tires.

It seems to me that if we make the leap of faith, a credit system is an acceptable way to do that. It seems to me that if, indeed, we want a marketplace, let us let the marketplace determine where the value of the credit is.

Senator **Wirth**. Dr. Marker, let us assume that 240 million tires per year were used for energy. Let us assume that we recycled 240 million tires per year into energy production. How many Exxon Valdezes is that, do you know?

Dr. **Marker**. What was the size of the oil spill? There have been so many lately.

Senator **Wirth**. It was 11.4 million gallons.

Why not do that calculation, and let me ask Mr. Serumgard a question. Could you do that? We all deal in a kind of shorthand.

I understand from Congressman Torres that in marking up the House RCRA bill the Rubber Manufacturers Association was asked to come up with a national plan involving incentives for scrap tire recovery by September 15.

Is that the case?

Mr. **Serumgard**. That is my understanding, yes, sir. I was not at that markup.

Senator **Wirth**. Are you preparing that for September 15?

Mr. Serumgard. We are working to see if we can develop a consensus of the entire tire industry toward that goal.

Senator Wirth. So you are developing that?

Mr. Serumgard. We have it in process. Frankly, we are concerned that we can find a consensus in that time frame, but we are working on it, yes.

Senator Wirth. We would appreciate anything that you come up with on that front. I would like to see that. Maybe some of that came in this discussion here where we asked you to be the referee on a higher use or a lower use or are we just trying to get rid of a lot.

Do we have an Exxon Valdez number yet, Dr. Marker?

Mr. Rouse. I can comment on that. It is about 4.5 million tires.

Dr. Marker. That is the wrong answer, though.

Senator Wirth. Wait a minute now. One Exxon Valdez is 4.5 million tires?

Dr. Marker. No. The question is what is the size——

Senator Wirth. Wait a minute. We have tires used every year of 50 Exxon Valdezes?

Mr. Rouse. The equivalent energy in a tire is 2.5 gallons.

Senator Wirth. So you would say the answer is there are 50 Exxon Valdezes a year out there?

Dr. Marker. We are saying the same thing. I would say one Modesto plant is the equivalent of an Exxon Valdez.

Senator Wirth. How many Modesto plants would we need if we just did energy recovery from the tires used every year?

Dr. Marker. About 50 to 60.

Senator Wirth. So we have 50 Exxon Valdezes is what we are talking about every year. What is the backlog? Do we have any idea?

Dr. Marker. Well, I saw some earlier documentation or assertions that put it at 5 billion tires. My number is more 2 to 3 billion, but who counts?

Senator Wirth. So we have a minimum of 500 and a maximum of 1,000 Exxon Valdezes stacked up there in the Modesto tire mountains of this country? Is that right?

Dr. Marker. Yes.

Senator Wirth. Those are sort of interesting numbers, are they not?

Dr. Marker. In the hills and valleys.

Senator Wirth. In the hills and valleys, the ravines of the USA; right?

Dr. Marker. Right.

Senator Wirth. Well, we ought to get the rubber manufacturers to start using figures like that and advocate this kind of reuse of tires, do you think? Make them think about all of that. Have the rubber manufacturers' advertisements in the Washington Post of Exxon Valdezes coming at the reader and saying we are out there to eliminate these spills.

Mr. Serumgard. Well, we would like to perhaps tone down the rhetoric slightly. We do have 250 million scrap tires, but if you sit out there as the mayor of Palm Springs or the mayor or Louisville, Kentucky, or the mayor of Miami, Florida, and look at your scrap tire problem, you do not have a 240 million scrap tire problem. You have maybe a 2 or 3 million scrap tire problem. That is the way the problem is going to get solved, by going down and working on what are relatively small scale——

Senator WIRTH. I understand that, Mr. Serumgard, but we are kind of looking at it as what is this resource out there. I think when you look at those kind of numbers illustratively, I was——

Mr. SERUMGARD. Instead of piling up little tires, we will pile up little Exxon Valdezes in our graphs and say this is how many Exxon Valdezes we have.

Senator WIRTH. People would understand that. They could sort of see it better.

Mr. BONO. That is true, Senator. Those examples do point out statistics sometimes in a capsulized version, and they work.

Senator WIRTH. Anyway, gentlemen, we thank you very much for being here. The record will remain open. I know that there are a number of questions that we want to follow up with as to all of you. I greatly appreciate your being here. I thank you for your patience this morning, and we will look forward to being in touch and getting back the answers on single credit versus a hierarchy of credits as one of the issues we are looking at, sort of looking at the goals we are after.

Mr. Serumgard, I greatly appreciate your being here. We look forward also to seeing what you come up with for the September 15 House RCRA markup.

Mr. SERUMGARD. Yes, sir.

Senator WIRTH. Thanks ever so much, Mr. Bono.

Mr. BONO. Thank you, Mr. Chairman.

[Whereupon, at 12:10 p.m., the hearing recessed, to reconvene at 2 p.m., this same day.]

AFTERNOON SESSION

Senator WIRTH. The subcommittee will come to order to resume the hearing.

Our fourth panel this afternoon is focused on the recycled oil issue. Our witnesses this afternoon are Mr. Michael Duffy, the Director of Environment and Health Affairs for Valvoline Oil Company in Lexington, Kentucky; Ms. Janet Graham, Director of Project Recycled Oil Saves Energy, Project ROSE, at the University of Alabama at Tuscaloosa; and Mr. Alan Gressel, President, Research Oil Company in Cleveland, Ohio. Perhaps Mr. Duffy, Ms. Graham, and Mr. Gressel might join us at the witness table.

I think you all are familiar with the rules of the committee, we would hope that you would be able to summarize your testimony.

As was pointed out earlier, we are also running parallel with legislation on the floor of the Senate. And what I would like to do, if I might, Mr. Duffy, is to get you going. And you could make your statement for the record; move to Ms. Graham and then to Mr. Gressel. I have to go address the issue of the B-2 very briefly. I will go and come back. And Senator McConnell, of whom I believe you are a constituent, Mr. Duffy, has indicated that he will be here very shortly.

So we will run our movable feast, if we might. I might ask you, sir, to go ahead. Ms. Graham, Mr. Gressel, I only ask your forbearance and understanding that we can only be in one place at a time. So we are trying to juggle that time.

Thank you very much.

Mr. Duffy.

STATEMENT OF MICHAEL J. DUFFY, DIRECTOR, ENVIRONMENTAL AND HEALTH AFFAIRS, VALVOLINE INC.

Mr. DUFFY. Mr. Chairman, thank you for the opportunity for Valvoline to appear today before the subcommittee and offer some comments on S. 2923, the Energy Production and Conservation Act of 1990, and share some of our experiences in the arena of used motor oil recycling with you.

As a leading manufacturer and marketer of lubricating oils, the issue of the proper handling and recovery of used motor oil is very important to us. As Senator Wirth noted this morning in his conversations with the Government witnesses, there is an increasing demand on the part of the public for recycling products.

This was an issue that came to our attention several years ago in the way of feedback through several of our major retail customers. And at that time Valvoline elected to take a look at the general issue of recycling and whether or not we should be involved in it, and based on that investigation concluded that we should expand into the area of recycling used motor oil, both from a product responsibility perspective, and also due to the business opportunities that it presented. And Valvoline made this decision and has started to do so, even though there is some risk involved.

At present, Valvoline is involved with two pilot recovery programs at the retail level, one in Southern California and Arizona with Chief Automotive; another one in Arizona with Northern Automotive. The primary purpose of these two pilot programs is to gain information on how you construct a cost-effective program for recycling used motor oil at the retail level.

Additionally, in December of last year, Valvoline Instant Oil Change, which is the install or quick-lube arm of Valvoline, announced that it would accept DIY motor oil back at any of its stores.

Valvoline is also the corporate sponsor for the Protect the Environment through Recycling Oil or PETRO program, which is a local recycling program sponsored by the Lexington/Fayette County, Kentucky, government.

In April of this year, we took another step and purchased the collection assets of Consolidated Recycling Company and formed a division called First Recovery, which is an active collector of used motor oil. And through an arrangement with Consolidated, this material is then re-refined.

And we have formed a second company, Pro Max, which is charged with the development and the marketing of re-refined lubricating oils.

Based on this experience, we have concluded that in order to have an effective used motor oil recovery or collection system, you have to have the resources available to collect it, then to process the collected material, and finally market outlets.

We believe that the infrastructure is generally there today in the United States. And the only thing that is really preventing it from coming forward and being utilized is the uncertainty that is associated with the handling of used motor oil today.

We believe that the Federal Government does have a role in the recycling or recovery of used motor oil. And that is to set ground rules that will address this uncertainty issue and risk issue.

First among those is a clear statement that used motor oil, destined for recycling, is not a hazardous waste. Second is to establish management standards. While necessary to protect the environment, they are not overly intrusive and burdensome. And finally, to offer economic incentives to add some value to used motor oil as it proceeds through the system.

If this is done, we believe that you will entice the retailers—the K-Marts, the Walmarts, Auto Zone, Chief—and voluntary public programs such as PETRO and Project ROSE into actively collecting used motor oil.

And finally, you will entice the refineries of this country to process the increased volumes of used motor oil that will be collected and then provide a market outlet for these products.

We believe that S. 2923, the Energy Production and Conservation Act of 1990, is a positive first step in this effort. And we look forward to working with the Chairman and the subcommittee on the issue.

I will be happy to answer any questions that you might have.

[The prepared statement of Mr. Duffy follows:]

TESTIMONY OF MICHAEL J. DUFFY
DIRECTOR, ENVIRONMENTAL AND HEALTH AFFAIRS
VALVOLINE, INC.
BEFORE THE SUBCOMMITTEE ON
ENERGY REGULATION AND CONSERVATION
OF THE
SENATE ENERGY AND NATURAL RESOURCES COMMITTEE
8/2/90

Mr. Chairman, thank you for the opportunity to appear before the Subcommittee on Energy Regulation and Conservation today to share Valvoline's thoughts on the recovery of used motor oil and to make some observations about S 2923, the Energy Production and Conservation Act of 1990, introduced by you and Senator Heinz last week. As a leading manufacturer and marketer of lubricating oil, the proper handling and recovery of used motor oil is an issue of great importance to us. We also believe this issue has quite properly become a matter of great importance to public policy makers focusing on the recovery of used motor oil.

Mr. Chairman, first I would like to explain how, as a company, we have approached the used oil issue and share with the Subcommittee our experience to date. Then I will lay out the steps Valvoline thinks must be taken to provide the proper incentives and safeguards to assure a successful used oil energy recovery system.

By way of background, Valvoline is a subsidiary of Ashland Oil, Inc., the nation's largest independent refiner. While Valvoline operates several other business units in the automotive aftermarket, our primary emphasis is the manufacture and marketing of lubricating oils, primarily for sale to the Do-It-Yourself or DIY market. In addition, Valvoline

Instant Oil Change (VIOC) represents our growing interest in the quick lube market with approximately 300 stores now in operation. During fiscal year 1989, Valvoline sales were approximately 140 million gallons of motor oil, making us one of the top four marketers in this country.

In the mid to late 1980's we determined that the proper handling and recovery or disposal of used motor oil was an issue that was gaining public interest and concern. However, based on feedback from a number of our larger wholesale customers one fact became obvious regarding used motor oil -- no other company appeared to be addressing the issue.

Based on our decision that we have an obligation to develop a viable comprehensive used oil recovery system, Valvoline has initiated several projects which will provide us with the necessary experience to develop this system in the markets we serve. These projects include the following:

In December, Valvoline Instant Oil Change announced that it would accept used motor oil from DIYers at all of its service centers. This made VIOC the first quick lube chain to aggressively solicit used oil for recovery. The purpose of the program was two-fold: (1) to educate our customers concerning the proper recovery and disposal of used motor oil; and (2) to gain experience in the procedures involved in the effective receipt of used motor oil at the store level.

Additionally, Valvoline has participated in a pilot collection process with two of its large customers at the retail level. Last November, Chief Auto Parts announced that it would accept used motor oil at 10 of its stores in southern California, and followed up with an additional 30 stores in the Ft. Worth, Texas area in March of this year. Northern Automotive announced during the Indy car race held in Phoenix in April of this year that it would begin accepting used motor oil at all 70 of its facilities in Arizona. These programs are aimed at publicizing the proper disposal procedures for used oil and providing answers to such questions as how much oil would a typical store recover and what policies and procedures are necessary to minimize costs and liabilities?

At the local government level, Valvoline is the corporate sponsor and an active participant in the "Protect the Environment Through Recycled Oil" (PETRO) program, operated in Kentucky by the Lexington-Fayette Urban County Government. In addition to collecting used motor oil, this program is examining the most effective ways of educating the public on the need to, and benefits from, recycling used oil.

The next step in the progression is to look at used oil recovery at the commercial level. In April of this year, Valvoline announced the purchase of the collection assets of Consolidated Recycling Company, Inc. (CRCI) and the formation of a motor oil collection division called First Recovery. First Recovery currently collects approximately 12 million gallons of used motor oil for recovery, mostly for re-refining, in the states of Kentucky, Indiana, Illinois, and Ohio. The majority of this oil is re-refined by CRCI under an arrangement with Valvoline. Valvoline has formed another company, Promax, whose mission is the manufacture and marketing of quality re-refined motor oils. Our goal is to help create a market for these environmentally important products among both the public and the various government agencies, which are encouraged to purchase re-refined lubricants under new government guidelines.

Based on this experience, we have concluded that any effective used oil management or recovery system contains three critical aspects. The first is capturing the used motor oil which has been generated, the second is providing adequate processing to handle the collected volumes and the third is providing sufficient outlets to market the reprocessed used oil.

The collection of used motor oil, especially for DIYers, presents a unique situation in that relatively small quantities of used motor oil are generated by a large number of individuals spread over a wide geographic area. An effective collection effort must not only educate the public as to proper methods of handling, but perhaps more importantly, make the proper means of disposal convenient.

The public education issue is best addressed through a multi-media public awareness program. Our experience and limited market research revealed that many DIYers believe that they are doing the "right" thing when, for example, they place their tightly sealed gallon jug of used motor oil in the garbage. A surprisingly high percentage of those individuals surveyed indicated a willingness to return used motor to a recovery system if it were convenient.

The second and perhaps most important part of the collection system is that of convenience. This is accomplished by maximizing the number of points at which used motor oil may be returned to the recovery system. In order to do this, it will be necessary to actively encourage retailers to accept back used motor oil and for private or government entities to establish local oil collection programs such as PETRO or those initiated by Project ROSE. Since the participation of the majority of these entities would be as a voluntary public service, it will be necessary to minimize the impediments such as the potential listing of used motor oil as a hazardous waste by the Environmental Protection Agency. Such listing would substantially increase disposal costs, the amount of paper work necessary and add a severe exposure to potential liability. This is not to say that there should be no standards addressing the proper management of the used motor oil at these sites. However, the key to effectively managing activities of this diverse and voluntary a population is a set of management standards that are both simple and uniform yet which assure protection of human health and the environment.

As an example, Valvoline has implemented the following procedures at our VIOC stores and recommend them to our retail customers. Storage at a retail store is usually provided by a 55 gallon drum equipped with an overpack to provide containment in the event of a drum leak. The storage is secure and the customer does not have direct access to the storage. An individual customer is limited to a maximum quantity of five gallons of used motor oil. Prior to accepting the used motor oil, the customer is asked if the oil contains any other substances such as gasoline, parts cleaner, or antifreeze, and must sign a log indicating their name, address, date and amount of used motor oil and certifying that the used motor oil does not contain any other substances. Should the customer refuse to sign the log, we will not accept the material. When the storage reaches capacity the collector/transporter, such as First Recovery, is called. The First Recovery driver will sample the storage in the presence of a store representative. One sample is analyzed onsite for the presence of chlorinated solvents and one is retained for later analysis should it be necessary. On return to the terminal the entire truck is subjected to a more detailed chemical analysis. Should this analysis reveal the load is not acceptable for processing, each of the retained samples is then analyzed to determine the source of contamination. The source of the contamination is contractually responsible for any additional cost associated with proper disposal of the contaminated material.

Even under the present system, there are transaction costs associated with the receipt and handling of used motor oil at a retail facility. Based on Valvoline's experience, these costs include approximately $500 per store to set up the program and between $20 and $35 per drum for disposal. Thus, in order to encourage voluntary participation, it would be extremely helpful to have in place some form of economic incentives which would impart additional value to used motor oil. This would, in turn, lower the handling costs and further encourage recovery. By establishing minimum requirements for energy production from used motor oil for the producers or importers of lubricating oil, section 102 of S. 2923 establishes a base to provide such economic incentives.

The next aspects of establishing an effective used motor oil recovery system are providing adequate processing and outlets to handle the volumes collected. The importance of these aspects is underlined by the rapidly increasing glut of recovered newsprint collected by existing recovery systems in the absence of a viable market outlet.

There are presently two primary market outlets for recovered used motor oil: (1) combustion as fuel oil to recover its heating value; and (2) re-refining into lube stocks for recompounding into lubricating oils. There is, however, some question as to the ability of these two outlets to absorb the ever increasing volumes of recovered used motor oil.

It is estimated that 90% of the used motor oil recovered today is burned for its fuel value. The heating value of used motor oil ranges between 130M and 145M BTU's per gallon. This compares to approximately 137M BTU's per gallon for #2 home heating oil and approximately 150M BTU's per gallon for #6 residual fuel oil. Under EPA's present regulatory program addressing "Used Oil Burned for Energy Recovery" the combustion of used oil which meets "specification" is essentially unregulated while the burning of off specification, but non-hazardous used oil is limited to large industrial furnaces and boilers or utility boilers. The ability of this market outlet to absorb additional volumes of oil, especially if the recovery system increases the overall value of used motor oil is questionable. Additionally, increasing regulatory concerns and requirements will probably have an adverse affect on the long-term viability of used motor oil fuels, thus decreasing the volumes which can be processed for this use.

Re-refining is the second and significantly smaller existing market outlet, accounting for approximately 4-5% of the recovered used motor oil. Re-refining is the production of new lube stocks from used motor oil through processing, usually vacuum distillation. There are presently three re-refineries operating in the United States, two in California and one in Indiana, with a combined total processing capacity of approximately 45 MM gallons per year. Construction of a fourth facility with an ultimate capacity of 75MM gallons per year was recently announced. Re-refining is viewed by many as the most desirable utilization of used motor oil and, additional re-refining capacity will undoubtedly be added. However, in the short-term this is not a viable outlet for the additional volumes of used motor oil that need to be and should be recovered because of limited re-refining capacity. Finally, even if the additional re-refining capacity were available, current consumer attitudes towards re-refined products can severely limit the amount of product that can be absorbed by the marketplace, at least in the near term.

In light of the above, the success of any used motor oil recovery program will turn on the ability to provide an immediately available outlet for not only the additional volume generated by the recovery program, but also any volumes displaced from other current uses of used motor oil.

From both an environmental and an energy perspective the most effective manner of providing this capacity is the recovery of the energy potential of used motor oil through conversion into other petroleum products by reintroducing the used motor oil into existing refineries as an alternate feed stock. However, there are several factors that must be considered and addressed to assure that refineries can actively participate in reprocessing used motor oil.

First, the amount of used motor oil which can be processed through a refinery amounts to only a small percentage of the total feed to the refinery. Processing of small volumes of used motor oil as an alternate feed stock is relatively labor intensive. Because of the need to involve refineries in this program, it is critical, therefore, not to add unnecessary regulatory burdens to the myriad of permitting and regulatory requirements that presently apply to refineries. (See attachment A for current permitting and regulatory requirements). In the event that used motor oil were listed as a hazardous waste and the refineries were subjected to obtaining a full Part B Permit under Subtitle C of RCRA, refineries, in Valvoline's opinion, would simply choose not to participate in the recovery system. Under the circumstances, the exemption language appearing in your legislation for those refineries which either burn for energy production or refine used oil solely to meet the owner of the facility's recovery requirements represents a cornerstone of any effective used motor oil recovery system.

Mr. Chairman, let me conclude by suggesting that our country is at a crossroads with respect to energy recovery from used oil. To achieve the dual goals of energy recycling and reducing the disposal of wastes into the environment we need to accomplish several things. We must work to change the attitudes and habits of our fellow citizens by educating the public on the value of returning used oil to be recycled as opposed to disposing of it improperly. This of course assumes we have developed and have in place a collection system that can handle in an environmentally sound manner, the volume of used oil that is generated and collected. In Valvoline's opinion, such a system must take advantage of the refining capacity in this country to deal with the volume of used oil which is collected. In this regard, it is critically important for the Federal Government to help develop a used oil recovery system that utilizes the existing infrastructure and expands the recovery system where appropriate through the use of incentives to develop a viable market for reprocessed products.

Valvoline views S. 2923, the Energy Production and Conservation Act of 1990, as a positive first step in this effort and looks forward to working with the Chairman, Senator Heinz and the other Members of the Committee and the Senate in the development of this type of recovery system.

Attachment A

Current Refinery Permitting and Regulation

1. NPDES (National Pollutant Discharge Elimination System) - All wastewater discharges other than to city sewers.

2. State water permits for equivalent and/or additional discharges (i.e. stormwater)

3. Pretreatment permits for discharges to city sewers.

4. SPCC (Spill Prevention Control and Countermeasure Plans) for all stored petroleum (some states have similar but more extensive requirements).

5. Underground storage tanks - state and federal.

6. Above ground storage tanks - proposed at federal level; currently by some states.

7. RCRA - Regulated as a generator of all hazardous wastes including but not limited to tank bottoms, air emission control residues, waste water treatment residues.

8. Air - Subject to extensive state construction and operating permit requirements and/or new source performance standards for numerous sources including but not limited to tanks, fluid catalytic crackers, boilers, process heaters, sulphur recovery units, load racks, and process sewers.

STATEMENT OF HON. MITCH McCONNELL, U.S. SENATOR FROM KENTUCKY

Senator McConnell. I know this is a panel. But if I could interrupt, I wanted to—like a lot of Senators, I have a lot going on today. And I appreciate Chairman Wirth, even though I am not a member of this subcommittee, giving me a chance to stop by for a couple of reasons. One was to commend Valvoline, which is a good corporate citizen of Kentucky. And the other is to make an opening statement and ask a few questions of them. And I will not delay you all very much.

We are, of course, grateful for the employment that you provide in our State. And I want to extend you a warm welcome. As we have heard, Valvoline, which is based in Lexington, is one of the top four marketers of lubricating oil in the country.

However, more important than Valvoline's economic contributions to Kentucky, is the company's environmental contributions to our whole country. I refer, of course, to Valvoline's efforts to collect and recycle used oil, to develop markets for that recycled oil, and to educate the public on the importance of recycling oil.

Clearly, Valvoline is positioned as a leader in this important and expanding field, for which I congratulate you. Notable among Valvoline's efforts is its corporate sponsorship and participation in the Protect the Environment Through Recycled Oil program. This program operated in Kentucky by the Lexington/Fayette County urban government collects used motor oil and educates the public on the benefits of recycling.

Valvoline's efforts and experience in this field put them in an excellent position to discuss the oil recycling provisions of this legislation, upon which we are having the hearing.

However, in addition to the presence of my friends from Valvoline, I have another interest in today's hearing. That interest is the role that waste reduction and recycling can play in addressing our Nation's solid waste crisis.

Chairman Wirth knows the solid waste crisis has hit our Nation in a big way. In Kentucky, we are struggling to get a handle on the problem. However, our efforts are hampered by the inflow of massive amounts of out-of-State garbage. I have introduced legislation to give Kentucky and other States more authority to regulate this out-of-State waste. And I hope to move that bill sometime this year.

I might mention I see my colleague from Kentucky here. He is a co-sponsor of that legislation, which I appreciate. We also have other members of the committee who are as well. That will take care of an important and immediate part of the problem.

However, it is only part of the solution. We must develop better recycling and waste reduction programs, if, as a Nation, we are to deal comprehensively and effectively with our solid waste problem. Clearly, today's hearing is a step in that direction, and I would like to ask you a few questions, Mr. Duffy, and then I will defer to Senator Ford.

Senator Ford [presiding]. Have the other two witnesses testified yet?

Senator McConnell. No.

Could you educate us on the economics of refining? What does it cost to re-refine a 55-gallon drum of used motor oil?

Mr. DUFFY. The actual processing of the used motor oil, the re-refining is a small part of the overall cost. The major part is the collection and the transportation—the logistics of the used motor oil—in returning it to the re-refinery, and then at the other end, formulating and compounding the base lube stocks which are the outcome of the re-refining process into products to be marketed.

Senator McCONNELL. What about transportation, packaging, marketing, that sort of thing?

Mr. DUFFY. The largest cost associated with the re-refining is the collection and transport of the material back to the re-refinery. Once it has been manufactured into a product, you enter into basically the same transportation network as any other product would.

Senator McCONNELL. What kind of marketing or advertising do you all do?

Mr. DUFFY. Directly, under Valvoline's name, of course, we have the media blitz that Valvoline Instant Oil Change undertook last December, and its continuing advertising that it will accept used motor oil from DIY'ers back at its stores. Valvoline has participated in the advertising campaigns of both Chief Automotive and Northern Automotive in their retail level recovery systems. And we are presently working with two other large retailers to advertise the issue of recovery of used motor oil, and the other side of that—the marketing of a re-refined product.

Senator McCONNELL. Do any other industrialized countries have oil recovery programs in place? And if so, what has been the track record?

Mr. DUFFY. Yes, in Europe it has been particularly effective, in France and Germany. In both instances, however, there is a very substantial government participation in the program. Recovery rates reach 80 to 85 percent.

Senator McCONNELL. Why is the re-refining capacity in this country so low?

Mr. DUFFY. It is an economic problem. Over the years, the overall quality of re-refined motor oils was less than acceptable. And it has fallen out of favor with the public. The American people, until very recently, had a very strong preference for new things, as opposed to reused or recycled things. And there simply was not the market available to sustain the products.

Senator McCONNELL. One final question, and then I will let the regular order proceed. The Wirth bill does not have a hazardous exemption for used oil. Without that exemption will you support or oppose this bill?

Mr. DUFFY. We support the general concept, but we believe that the listing issue is, by far, the most important cornerstone, or foundation, if you will, of implementing a truly effective used oil recovery system in this country, both at the collection level, the retail level and at the processing level.

Senator McCONNELL. Well, I thank you, Mr. Duffy, and I appreciate the witnesses letting me interject here to commend Valvoline for its efforts and have a few questions of them.

Thank you very much.

STATEMENT OF JANET H. GRAHAM, COORDINATOR, PROJECT ROSE, UNIVERSITY OF ALABAMA

Ms. GRAHAM. Mr. Chairman, distinguished committee members and guests, on behalf of Project ROSE, which is Recycled Oil Saves Energy, I want to thank you for this opportunity to provide testimony regarding Alabama's used oil recycling success story.

Since its inception in 1977 as an optional energy saving program funded under the Carter administration, Project ROSE has been funded by the Alabama Department of Economic and Community Affairs, Science, Technology, and Energy Division, and sponsored by the College of Engineering at the University of Alabama.

More recently, Project ROSE has obtained sponsorship from the Alabama Department of Environmental Management. The mission of Project ROSE is simple: to conserve energy, to preserve the environment, and to slow the depletion of our natural resource, petroleum.

Project ROSE accomplishes this mission by providing education and information to Alabamians, and by promoting a grassroots recycling ethic. Individuals who change their own oil, or the do-it-yourselfers, who we call the DIY's, are encouraged to properly collect, manage, and recycle their used oil at 1 of over 200 collection centers in our State.

Their active participation in the recycling process reinforces the idea that one person can make a difference in preserving the environment, while saving a valuable energy resource.

Earth Day raised the environmental consciousness of many Americans and focused attention on ways in which we can become active in saving our planet. Saving energy, conserving our dwindling natural resources, becoming better consumers by reducing the volume of waste we generate, and looking for solutions to problems caused by the greenhouse effect are issues which have been placed before each of us. These are issues which require our participation to stop our wasteful practices.

Project ROSE was featured on ABC's Earth Day telecast as one common sense approach to managing used oil. It is a waste which each of us generates. This telecast has prompted individuals from Alabama and throughout the United States who are interested in recycling used oil or in developing a recycling program to call or correspond with us regarding what they can do in their area to establish a similar program. Incidentally, we received calls for other materials, such as tires, paint and pesticides.

Earth Day has demonstrated that Americans are concerned enough about energy savings and environmental protection issues to change their throwaway habits and adopt a new attitude directed at waste reduction, reuse and recycling.

Project ROSE offers individuals the opportunity to recycle material that has a direct impact on energy savings and environmental protection. Project ROSE documents the energy saved through a voluntary, cooperative effort between ROSE and members of the used oil recycling industry. These are the generators and reprocessors of used oil.

Of the 17 million gallons of used oil generated by individuals and small businesses in Alabama, 8.2 million gallons were recycled this past year in our State—by comparison with the Exxon Valdez spill of 11 million gallons.

The 8.2 million gallons of used oil recycled by individuals and small businesses in Alabama is evidence that programs like Project ROSE can impact positively on our environment at significant levels.

Participation in Project ROSE is voluntary and not mandated. To encourage voluntary participation, our program must rely on education. Perhaps the single most important element that sets our program apart from others is a strong education component which focuses on energy savings and environmental preservation.

The Project ROSE philosophy, one person can make a difference, is the basis for this education program. Project ROSE encourages DIY's to be part of the solution, rather than part of the problem. Our education program focuses on energy savings and the environmental harm or damage that results from improper disposal of used oil. Energy savings would then translate into terminology that have an effect or a meaning on the DIY.

Use of facts and statistics can have a positive impact on DIY recycling attitudes. For example, we say, and we can document, if all of the used oil generated by DIY's in Alabama were recycled, it would supply enough power for 50,000 automobiles for 1 year. If all the DIY oil were recycled in our Nation, it would power 360,000 homes for 1 year.

EPA has provided several other startling statistics which link energy savings and environmental protection to the indiscriminate disposal of used oil. The used oil generated by 1 oil change, 1 gallon, will contaminate enough fresh water for 50 people for 1 year. That is the equivalent of 1 million gallons of water.

Sewage treatment plants discharge as much oil into coastal waters as do tanker accidents, 15 million gallons per year. More than 40 percent of the water quality trouble calls received in the Seattle area were related to oil dumped down storm drains.

These facts confirm that most DIY's perceive there is no convenient method for disposing of their used oil. Without proper education, they most often choose environmentally-harmful methods like dumping oil into fresh water supplies or down storm sewers, or pouring it onto the ground or sending it to the local landfill.

The cumulative effects of these practices can sufficiently contaminate local water supplies to render it unfit for use. These DIY's are throwing away a valuable natural resource.

Recycling must be convenient if DIY's are expected to participate. A 1981 study commissioned by EPA found that 75 percent of the DIY population would always recycle, if it were convenient.

To offer this convenience, Project ROSE has several recycling programs for Alabama citizens. We offer curbside collection, local collection centers, and tanks located in rural areas which accept this oil from individuals. These collection methods are tailored to local constraints to find the program that best suits their needs.

In addition to the local collection programs which manage small quantities of used motor oil, Project ROSE also plays a key role in oil management through the ROSE waste exchange. The waste exchange concept is recognized by EPA in the Agency's pollution prevention agenda or hierarchy as a legitimate waste production program.

In addition to the waste exchange, which provides small businesses a coordination service with local recyclers, Project ROSE maintains contact with businesses to disseminate regulatory and legislative information concerning used oil and acts as a natural interface between small business and State regulatory agencies.

Waste exchange is a key term that must be utilized more often in defining the recycling of used motor oil and other oils. Used oil is a unique waste stream because it has a value, or an end-use, and a market. This waste stream can be reprocessed and/or re-refined into a marketable product.

The concept of a waste exchange embraces the idea that waste from one source may be the feedstock material for yet another business, and thus it becomes an exchange product and not a waste material.

All used oil generated in Alabama is recycled as a reprocessed fuel oil. None of the re-refineries that served the Southeast in the past are operational today. Oil continues to be recycled in this way, because the product's demand drives a healthy, competitive market. The demand for used fuel oil continues to move volumes of oil through the used oil management system.

Even at its current, depressed value, used oil is a direct competitor for virgin oil and natural gas. Used fuel oil sells for a slightly lower cost per gallon than virgin oil, thus lowering the overhead of costs or costs for permitted burners. This slight incentive for used fuel oil is the factor that shifts the supply and demand curve in favor of recycling.

Since the age of mechanization, all used oil was collected for recycling. Now, a lack of education and the throw-away attitude of our society has focused our attention on this one sector, which has a tremendous recovery potential.

It is only in recent years, since the 1960's, that the DIY's emerged as a quantifiable source of used oil. The rise in DIY activity, precipitated by the unparalleled jump in virgin oil prices, has forced a large volume of this DIY oil to fall out of the used-oil management system.

It is this rather significant waste stream that can be recovered for energy reuse. Programs like Project ROSE have the potential to divert the 200 million gallons of used oil dumped in our Nation each year through a common sense management approach.

Surely, our environment, and natural resources can be enhanced through programs that recycle, reduce, and reuse.

Thank you.

Senator FORD. Thank you very much.

Mr. Gressel, do you want to proceed?

STATEMENT OF ALAN GRESSEL, PRESIDENT, RESEARCH OIL CO., ON BEHALF OF THE NATIONAL OIL RECYCLERS ASSOCIATION

Mr. GRESSEL. Yes, thank you.

Senator FORD. If you want to highlight yours, it would be fine. Whatever.

Mr. Gressel. Yes, I will start out by endorsing the statements of my predecessors. That will save a lot of time.

Senator Ford. Thank you very much. Does that end it?

[Laughter.]

Senator Ford. We are having a hard time this afternoon, and I apologize. I came in cold. Senator Wirth has an amendment on the floor, so we are—it is obvious that two Kentuckians are here because of Mr. Duffy; I want you to know that. He happens to be one of our constituents. So we will lay it all out. But I am delighted I can be here to listen to you.

Mr. Gressel. My company has been in business since 1932 in the business of re-refining and recycling used oils. We started in the Depression, because a gallon of good oil cheap was a good thing.

During the Second World War we survived by making lubricants for defense plants that could not otherwise survive without a supply of used oil.

During the many years in which we have had to survive in changing environments, influenced both by the price of crude oil and by Government action, we profited immensely when the lubricating excise tax was applied to virgin oil and not to re-refined oil. That kept us in business for many years.

We suffered when the Federal Trade Commission determined that people would not buy used oil if they knew it were used, and required that every can of re-refined oil be labeled made from previously used oil. And we went off to look for other things to do with oil—making it into industrial lubricants. We even turned it into synthetic rubber, although we were not successful in convincing the rubber people in Akron that re- used oil was such a consistent raw material that they could use the product.

And in putting it the other way, some years ago, when those 7 million tires out there in Winchester, Virginia, caught fire, we were the company that paid the EPA for the oil that they recovered from that fire because we had learned in prior incidents how to make a product out of the residue of burning tires. And we recovered over almost a million gallons of fuel oil from that fire, which went into the industries in Cleveland to provide cheap energy.

We do believe that Government policy can have a profound effect on the amount of oil that can be recovered in this country and, therefore, we are strongly in support of this bill.

We want to re-emphasize two points that were made, both this morning and this afternoon. The first is that if used oil is a hazardous waste, this bill cannot help. And secondly, that when the bill—if the bill is passed, the regulations should be drafted so as to discourage excessive amounts of paperwork and the opportunity for fraud, which raises its head in any Government program that tends to tilt the economics from one direction to another.

Thank you for your patience, and I will be pleased to answer any questions.

[The prepared statement of Mr. Gressel follows:]

PREPARED STATEMENT OF ALAN GRESSEL, PRESIDENT, RESEARCH OIL CO., ON BEHALF OF THE NATIONAL OIL RECYCLERS ASSOCIATION

My name is Alan Gressel. I am the President of the Research Oil Company of Cleveland, Ohio, a recycler of fuels and lubricants from used oils, and a charter member of the National Oil Recyclers Association ("NORA"). My testimony today is on behalf of NORA as well as Research Oil.

Research Oil has been in the business of reclaiming used oil since 1932, when low cost, high quality, rerefined motor oil offered real benefits to the unemployed workers in the Cleveland area. During the Second World War, Research Oil rerefined industrial lubricants for defense plants, in addition to rerefining motor oil from crankcase drainings.

Starting in the 1970s when energy prices began to rise in the face of the oil embargo (and the perception of a long-term decline in the world's energy resources), Research Oil added industrial fuel to the products it recycled from used oils. The company has responded to the environmental imperatives of the past two decades by developing facilities to reclaim energy from industrial liquid wastes which, up until then, had provided fuel for the burning Cuyahoga River.

I first began to work at Research Oil during my high school vacations in 1946 and 1947. I became a full-time employee in 1951 and have been associated with the company ever since. My four decades of experience in this field have taught me that changes in federal and state laws and regulations tend to have profound -- sometimes unintended -- effects on the oil recycling industry. For example, during the 1950s, my company was the substantial beneficiary of the exemption of rerefined lubricants from the federal excise tax on lubricants. In many cases, the excise tax of $.06 per gallon represented the entire price differential between virgin and rerefined motor oils. While very helpful to industry at large, the repeal of this tax caused major damage to the rerefining industry. Our company survived by eliminating any payment for collection of used oils, which we previously had been buying at $.06 to $.075 per gallon while the tax was in effect.

Our business and the business of other rerefiners of lubricants made from used oil was also greatly affected by Federal Trade Commission regulations requiring the labeling of all packages of rerefined oil as "made from previously used oil." Although our company never packaged lubricants for retail sale, we had supplied rerefined lubricants to other packagers. We survived the detrimental Federal Trade Commission regulations by concentrating our rerefining efforts on the production of such specialized industrial lubricants as cutting oils, grinding oils, hydraulic oils, drawing compounds, forging compounds, and such non-lubricant industrial oils as quench oils and transformer oils.

Between 1964 and 1968, as Plant Manager of the Research Oil Company, I was fully engaged in developing other alternative uses for products made from used motor oil so that we could avoid the problems attendant to marketing a rerefined motor oil carrying the stigmatizing label, "made from previously used oil." Although the company was successful even then in marketing substantial volumes of partially rerefined used oil for inclusion in crude oils run to refineries in Ohio and western Pennsylvania, this effort was retarded by the tendency of the lead then present in used motor oils to poison the cracking catalyst used in refinery operations. This problem is no longer significant because -- as a result of EPA's phaseout of lead in gasoline -- average lead levels in used oil today are only about one percent of what they were 25 years ago.

Other recycling applications of used oil are also feasible. For example, an experimental program carried out in conjunction with the Akron Rubber Development Company led to the development of high quality synthetic rubber formulated with used crankcase oil as a substitute for virgin oil. Unfortunately, the commercialization of this program was frustrated by the strongly held presumption that used crankcase oil was not a sufficiently uniform raw material for dependable formulation of synthetic rubber. This problem, too, has been resolved by substantial experimental work performed at the Bartlesville

Energy Technology Laboratory of the U.S. Department of Energy during the late 1970s.

The connection between oil and rubber can also be seen in the context of the recurring problem of tire fires. In August, 1982, Research Oil assisted the Ohio EPA Emergency Response team by removing over 100,000 gallons of oil resulting from a fire which engulfed one million tires stored adjacent to the Cuyahoga Valley National Recreational Area. Helping EPA solve this problem equipped us with the experience to receive and recycle almost one million gallons of the oil that resulted from the 1983 tire fire in Winchester, Virginia. Along with Title I, Title II of the proposed legislation will encourage the reuse of waste oil not only as a by-product of tire recycling, but as an ingredient in the formulation of new synthetic rubber. Most important, the recycling credit system will foster creative new uses of waste oil as a substitute for virgin oil, with substantial energy savings.

The Committee should also be aware that the oil recycling industry has been influenced as much by the price of crude oil as by government regulation. Recycled industrial fuel oil must compete with such alternative solid, liquid, and gaseous fuels as virgin No. 6 oil, coal, coke, petroleum coke, and natural gas. One of the fundamental economic principles of this industry is that for each application, the reclaimed product, in order to be sold, must be less expensive than the least expensive virgin alternative.

Our company has survived the drop in the price of crude oil over the past five years by combining oil recycling with the treatment of oily wastewaters and other industrial liquid wastes. Whereas in 1985 Research Oil derived 75 percent of its revenue from the sale of recycled fuels and lubricants, today the company derives 75 percent of its revenue from charges assessed to the generators of the oily liquid wastes from which we create our products. It should, therefore, come as no surprise to the subcommittee that I am here to testify in support of the "Energy Production and Conservation Act of 1990." Although Research Oil has designed and constructed many sophisticated process units in order to be able to squeeze the last drop of petroleum from industrial liquid waste, we also are active in the collection and recycling of used automotive lubricants, both from the automotive sales and service organizations and the individual automobile owners who choose to change their own oil. The company has undertaken two initiatives to promote the collection and recycling of do-it-yourself oil.

First, in cooperation with Environmental Health Watch, a local environmental interest group, Research Oil

Company provides collection tanks, free of charge, to any non-profit or local government recycling center that will agree to receive used oil from any do-it-yourselfer at least one day per month, usually on Saturdays. These Saturday collection days are widely publicized so that citizens of towns and suburbs which have not yet joined the program may take their oil to a recycling center otherwise only available to residents of the sponsoring locality. Research Oil picks up the used oil from the non-profit and local government recycling centers at no charge, although the cost of this service far exceeds the value of the oil collected. The alternative to these cooperative collection efforts is, of course, the improper disposal of used oil into the sewer, the backyard or the trash can.

Second, Research Oil has chosen to assess a standard per-stop charge for the collection of used automotive oil from members of the automobile service industry. The per-stop as opposed to per-gallon charge does not discourage acceptance of do-it-yourself oil by the individual gas station or automobile dealer. Although we are able to subsidize the collection of used oil from do-it-yourselfers because of the large volume of industrial liquid wastes processed through our facility, these options are not available to the majority of used oil processors. The economic incentives that should result from the enactment of this legislation will, in my opinion, stir other members of the used oil management system to employ these and similar initiatives to attract used oil from the individual automobile owner into the used oil management system.

During the past 12 months, the idea of recycling credits embodied in this and other proposed legislation has been discussed throughout both the petroleum refining and marketing industry and the used oil management system. Even though this legislation is still being considered at the subcommittee level, Research Oil has already been approached by major oil companies to solicit the commitment of our company to collect used oil generated by their quick oil change units, their gas stations, and the marketers of their industrial lubricants.

While we are confident that the enactment of this bill could have a substantial impact in increasing the volume of used oil returned to the crude oil refiners as well as the used oil management system, a couple of additional factors should be considered carefully. First, if used oil is listed as a hazardous waste, it will seriously undermine the ability of the used oil management system to function. Transforming used oil from an asset into a liability, that is, a hazardous waste, simply destroys any incentive to expand the used oil management system to encompass used oil that is being improperly disposed of. Service stations, for example, will simply refuse to handle oil from do-it-yourself generators. It makes more sense to impose regulations which protect human health and the environment while avoiding the unnecessary problems resulting from listing. This approach, which is embodied in Rep. Skelton's bill, H.R. 1593, and Rep. Luken's bill, H.R. 3735, is entirely compatible with the recycling credit concept. In fact, not listing used oil is an essential predicate to the success of the credit system.

Second, in drafting this legislation, it is essential that Congress design a system that is largely self-enforcing -- rather than one whose integrity depends on an army of "recycling credit police" who must constantly review tons of paperwork. While there probably will always be some dishonest individuals who will find a way of fraudulently exploiting the system, the Committee should craft this legislation in a way that minimizes the opportunities for cheating and reduces the paperwork to what is reasonable and necessary. Although criminal fraud sanctions are already on the books (18 U.S.C. § 1001), I recommend that the Secretary of Energy be specifically directed to promulgate regulations which minimizes the potential for fraud and be given the authority to assess substantial civil penalties for violations of the Act.

In conclusion, the National Oil Recyclers Association strongly endorses this legislation. If enacted and properly implemented, it will provide meaningful incentives to conserve energy and safeguard the environment.

I would like to thank the Committee for the opportunity to present this testimony. I will, of course, be pleased to answer any questions.

Senator **Ford**. Thank you for your brevity.

You say that if oil is declared a hazardous material that we are out?

Mr. **Gressel**. I think so. It is very difficult to encourage collection. We are in the hazardous waste business, as well as in the used oil business. We are, basically, the company that cleans up the junk that used to get put in the river, the Cuyahoga River, which you may remember used to burn.

Senator **Ford**. Yes.

Mr. **Gressel**. That is really what used to happen. The steel mills could not put it in the river anymore, so they put it in tanks and we recover the oil from that massive amount of waste water from industry. And we understand because of the response to industry and others to listing.

In Cleveland, Ohio, prior to 1985, 60,000 gallons a day of hazardous waste was burned in making steel at LTV. And then the EPA said that burning used hazardous waste for energy recovery required a permit. And LTV shut down the program completely, because they did not want to be involved with the processing of hazardous waste.

We believe that you dissuade people from collecting something when it is a hazardous waste. You create the fear of liability. In Cleveland, we provide any nonprofit with a storage tank and agree to pick up any motor oil that they collect from do-it-yourselfers. We assume the liability; they will not. We can get the program to work so long as we, who are also in the hazardous waste business and are not afraid of the problem, are willing to take the used oil.

But without that assumption on our part of liability, the do-it-yourself collection program in Cleveland would fail. We tried to help the gas station, even though he has to pay us to pick up his waste, we charge him by the pick-up, rather than by the gallon. So that if the do-it-yourselfer brings in the oil, it does not create an additional cost to him to try to persuade him to do this. But to ask him to collect the hazardous waste and pay someone else to take it away would mean he would just get out of the oil-collection business.

And I think that the dismantling of the re-refining industry in the 1980's is not only a matter of economics. It was also a matter of the fear of getting involved in the processing of a hazardous waste.

Senator **Ford**. Ms. Graham, what is your opinion if used oil is declared a hazardous material under RCRA?

Ms. **Graham**. If used oil is declared a hazardous waste, then most certainly our collection centers would cease and desist taking it, obviously. We have already been told by—in a section of my testimony there—that they would no—service stations would no longer accept used oil. And our collection centers are primarily service stations.

Invariably, when we explain the concept of Project ROSE and the program, which has great potential, the bottom line is always what is the liability associated with it if it is a hazardous waste.

K-Mart as a corporation got out of the program when I started with Project ROSE in 1985 and no longer accepts it. And the Muscular Dystrophy Association had a collection program for used oil.

They dropped the program in 1985 when the regulation was proposed to list it as a hazardous waste.

Senator FORD. Mr. Duffy, do you agree with what they have said?

Mr. DUFFY. Yes, sir. Ms. Graham made the point earlier that an effective DIY collection system includes education and convenience. And convenience is maximizing the number of points across the country that the DIY oil can get back into the system.

And has she has just pointed out, if it is declared a hazardous waste, Wallmart, K-Mart, service stations—people are not going to want to touch the stuff.

Senator FORD. Well, let me ask you this, if anybody would want to respond to it, is it a hazardous waste?

Mr. GRESSEL. Under the current—I will give you my scientific opinion.

Under current regulations——

Senator FORD. Since I am not a scientist, how about just giving me some common sense?

[Laughter.]

Mr. GRESSEL. Okay, there is a new Government regulation called a new test to determine whether a product is a hazardous waste. It is called the Toxic Characteristic Leaching Procedure. Under that test, any used oil that will filter, will test—I can almost swear to it—will test as a hazardous waste. Fine.

But under current regulation, the recycling of that to a product gets that oil back out of the system. So no one is frightened. But if you say it is a listed hazardous waste, we define it as such. No matter whether it tests or not, then you have put everybody on notice that they have a liability problem. And if you read about the problem of the banks and their liability from lending money to people like me, and their having to clean up my plant when I go broke, you realize how far out the rippies of this listing go.

The fear of the Superfund clean-up of the person who stored the hazardous waste in a tank on his site and it ran over 1 day, or someone was careless and did not pour it right into the tank but poured it next to it. And you see how difficult—you know, probably that petroleum is exempt from Superfund, but if used oil were listed a hazardous waste it would no longer be exempt. And all of these things would tend to be very, very disastrous for the collection system.

Senator FORD. Well, when you refine it, there are materials that are left over that are extracted. What do you do with those materials?

Mr. GRESSEL. We manage those as hazardous waste.

Senator FORD. That is known as hazardous waste now?

Mr. GRESSEL. Yes, if it tests so, it is so managed. And we manage ours as if they are hazardous wastes. And I think everyone else in my business would do the same thing.

Ms. GRAHAM. Same here.

Senator FORD. Mr. Duffy, same thing.

There is always something to take the romance out of everything, is there not?

Ms. GRAHAM. There is so much oil out there, from my perspective, from the do-it-yourselfer perspective. Everyone generates it in everything they drive or operate. It is in widely dispersed areas, everywhere.

And you have to get it to a centralized point for collection. You will drive more of that oil out of the collection system by listing it than you will getting it into the system by listing.

Senator **Ford**. Say that one more time for me.

Ms. **Graham**. If you list it as a hazardous waste, more of that oil will be dispersed away from collection programs than will be brought into collections because——

Senator **Ford**. Be dumped on the ground and everywhere else so it will not be——

Ms. **Graham**. Because people will not respond to that hazardous waste listing and feel compelled to recycle. And people will not be willing to accept it.

Senator **Ford**. Well, where are we, then, when we test and it is determined that it is a hazardous waste? We cannot just say it is not a hazardous waste just to get it collected.

Mr. **Gressel**. But it is only a waste if it is not made into a product.

Under this wonderful RCRA definition, before you can be a hazardous waste you must be a waste, a solid waste. And so our position is that this used oil is a raw material for his plant, her collection system, and my plant. And so it is not a waste.

Therefore, we are no more concerned about it being hazardous than you are about the gasoline you pick up at the gas station. It is far more hazardous than our used oil, but it is not a waste.

And so, as long as we are managing this as a product, the waste from our process are hazardous waste, but the thing we work with—our raw material—we consider to be of value and not of waste. And that is why we are in this business.

When Mr. Duffy's refinery or his competitors who are nearer to me finish their process, they generate liquid, hazardous waste, which I pick up and process through the hazardous waste part of my plant. When I finish my process, I have wastes which have to be disposed of as hazardous waste, and I send off to be properly disposed of at a cement kiln, licensed to burn them, rather than sold into commerce.

And so we take the obligation to remove the contaminants from this oil so it can be reused and dispose of those contaminants as the hazardous wastes that they are.

Senator **Ford**. Let me ask you, Mr. Duffy, you talked about when you refine. Can this go through a regular refinery? Do you have to have a special refining unit? How do you operate used oil and turn it into new oil?

Mr. **Duffy**. Senator, there are a couple of options available for reintroducing it into a traditional refinery as opposed to a re-refinery. You can put it in the front door as part of the crude oil stream or you can introduce it into other processing units within the refinery.

Because of process limitations, the amount which you can put into the refinery is somewhat limited, which means that in a refinery that is built to handle large volumes of crude oil in a day, it is not the most desirable processing approach, but it is a viable approach, and that is not to say that some of the byproducts from the refining process itself and from the refining of used motor oil would not be hazardous wastes.

We are not saying that used motor oil should never be a hazardous waste. Our position is that used motor oil that is destined for recycling or recovery would not be a hazardous waste. If in fact you were going to dispose of it as a waste, then it would be a hazardous waste.

Senator FORD. Well, some companies do not produce their oil, and you understand this Mr. Duffy, and they contract with countries in the OPEC arena, and what transpired there last night with Iraq and Kuwait—and I guess Iraq is about 3.5 million barrels per day and Kuwait about 700,000 to 1 million, something like that. I am not sure that is right.

But I remember 1973. That was pretty tough. I was Governor of Kentucky, and I was driving an 18-wheeler, trying to get oil around to school buildings and penitentiaries and all that kind of stuff. I was up there, and the only thing we lucked out is Ashland Oil had the pipeline, and it saved us a great deal. It kept us from having the catastrophe that other States had, and I have always felt kindly toward Ashland Oil since that time.

Then we had the 1977 Iranian, 400,000 barrels a day, and everybody went crazy again, and most of the reserves in the tanks, because everybody kept their tanks full, they would drive down town and come back and put another half-gallon in their tank, so our reserve was running down there.

Now we have got another little debacle. About the only thing that will happen here is the price of gasoline will go up. I do not think anybody will worry too much about the oil. But say this continues. Would refined oil, or used oil—how important is it then? Would Valvoline want that oil and use it under those circumstances, when I am sure a large portion of oil for the Valvoline Company would come out of the Gulf?

Mr. DUFFY. We want it now. Obviously, under the scenario that you just outlined, every gallon or barrel of used motor oil additionally that you recovered would help. There is no question about that.

Senator FORD. Would it help us in our deficit balance of payments, or are we in a position to get that big yet? The visionary thing is, I guess you could. What are we importing, about 8 million a day, and domestically producing about 7 million? We have been doing that for some time now; and domestically we keep dwindling. It has got some fascinating end results to it, I think. Is you operation called PETRO?

Mr. DUFFY. That is Lexington, Fayette County urban government's program, yes, sir.

Senator FORD. What has been your experience with them to date?

Mr. DUFFY. Pretty much the same as project ROSE has. One of the things that we have learned is that education of the DIY'er is extremely important, and if you are going to have an effective collection system you have to educate them as to what is proper disposal and what is wrong. There are a large number of people out there, for example, that believe that they are doing the right thing when they screw the lid on tightly on that gallon milk jug full of used motor oil and gently place it in the garbage. They believe that that is an environmentally acceptable thing to do. So education is extremely important, and it has to be a continuing thing.

Senator **Ford**. What is local government doing specifically to help in this project? We are getting into the position where we are going to separating our garbage in three separate cans. Companies are going to be picking up two of the bags and the city is going to be picking up the third one, probably, that is the way I see it, or they may contract to take all three of them.

So we are beginning, and civic clubs are beginning, to pass out plastic bags, and people are proud. I have got three bags out front on collection day and you do not have. Where are yours?

So what is government doing in Lexington to promote this? I am not familiar with it, and I should be.

Mr. **Duffy**. In addition to PETRO, which is specifically oriented at used motor oil, on the overall waste recycling they have instituted a pilot program where they are going to add a Rosie to your Herbie, where the additional collection or container would be for these materials that are to be recycled. Assuming that that is a success, they plan to expand the program to the entire county.

Senator **Ford**. How confident are you—I mean, I am proud of the program. I am impressed with it, and I think you are doing a good job and you need to be complimented. I think all of you do.

We have got, I guess, public and private and industry, all three right here at this table. All of you appear to me to be doing very, very well, or at least making the right kind of effort, but how confident are you of gaining the support of others in the petroleum industry? Is this going to be just something that one company is going to work on, and it is not going to be caught up by other companies, or are other companies now trying to do the same thing?

Mr. **Gressel**. We have been contacted by both Quaker State and by Citco to ask us if we would participate with them in collecting oil from the places where it was sold by them or changed by them, so that they could be responsible for its recycling. Ashland is way ahead of everybody, but it is not just Ashland.

Senator **Ford**. What about the big boys—the big boys?

Mr. **Duffy**. The companies that are active motor oil manufacturers and marketers are deeply involved. Quaker State, Penzoil, Valvoline, Castrol to a degree. The larger refiners are not really involved in the DIY market. Although there is some interest on their part, they are not as directly involved with the issue as those of us that are in the marketing business are, but there is a lot of interest picking up both at the State and local level on the government side and from industry, not to mention the retailers.

Senator **Ford**. Now, if the administration puts on a Btu tax, and we could get oil that would be coal oil and natural gas, if we could figure out some way, Mr. Gressel—you mentioned tax early on. If we could figure out some way where this is not being taxed, it might be in our best interest so we could recover this and reduce our deficit.

Mr. **Gressel**. That would probably be a very effective way to get this collected and recycled.

Senator **Ford**. I am serious.

Mr. **Gressel**. So am I.

Senator **Ford**. You have to have a carrot on a stick, and the carrot here, in order to do that, is that you are encouraged to do that by no tax. What I am concerned about here is, you have already had taxes levied one time, and I would hate to see you go to all this trouble to refine it and go through all that and be taxed again.

Mr. **Gressel**. That is exactly the argument that was used on the excise tax, that the oil that we recovered had been taxed last time, and therefore it should not be taxed again.

Senator **Ford**. My grandfather was a great Democrat, but one hell of a conservative when it came to the after-tax money. He invested it and got interest from it and had to pay interest on the after-tax money. He never understood that to his grave, and that kind of rubbed off on me a little bit. So there has to be ways we can do this.

Ms. Graham, when the Federal Government assisted you, now you are on your own as far as State and local money, is that correct?

Ms. **Graham**. Actually, it is Department of Energy money. It is an optional energy savings program for our State.

Senator **Ford**. Do you get any Federal funds to help you with your program? You used to, but you do not now?

Ms. **Graham**. No, sir. The money that the State uses to fund my program is Federal money, Department of Energy money.

Senator **Ford**. Is it 100 percent?

Ms. **Graham**. Yes, sir.

Senator **Ford**. What do you do with the money? Do you get any money from refining, or what do you do?

Ms. **Graham**. No. We strictly provide information and education.

Senator **Ford**. That is it?

Ms. **Graham**. That is it.

Senator **Ford**. Then you have to find somebody to pick it up under that deal and to go into the re-refining?

Ms. **Graham**. Yes. The oil that is picked up is reprocessed, like Mr. Gressel's facility.

Senator **Ford**. So you would educate people to do it, and he would be the one who would be willing to step in, or Mr. Duffy?

Ms. **Graham**. Correct.

Senator **Ford**. Talking about incentives here now, Ms. Graham, do you see the role of economic incentives, maybe getting into do-it-yourselfers position? If it is going to be a hazardous waste, the fellow has his oil changed, he may have to pay the fellow changing his oil for taking his oil.

Mr. **Gressel**. That is why we suggested, if it became a hazardous waste, the fellow changing the oil would put the oil in a little plastic jug and then put it in the back of your car and you could decide how to get rid of it.

Ms. **Graham**. Take it home.

Mr. **Gressel**. Like they give you spark plugs or any broken part to demonstrate that he changed it. He would decide he was going to give you your oil back and that you could throw it away, because you are an exempt small quantity generator. But he could charge you more.

Senator **Ford**. And he could keep it on that basis.

Mr. **Gressel**. And pay somebody to take it.

Senator **Ford**. It would cost the consumer on that basis.

I guess I could go on and probe some things, but we have other witnesses. I like what I hear, and this is exactly what this bill apparently is trying to get into, and I think we have had three people, as far as I am concerned here, that gives us all facets of it, and I am delighted that you all were able to come and able to testify this afternoon.

There may be questions, Mr. Duffy, Ms. Graham, Mr. Gressel, that other panelists who could not be here under the circumstances may want to ask you, and those questions will be sent to you in writing and we ask that you respond in a timely manner so they can be incorporated.

Maybe we will get them out in the next few weeks and have, say, September 15 or something, but we will try not to probe your business too much, but we want answers to some of the questions that track the bill. So if you would do that in a timely manner, I think we would be grateful.

I do thank all three of you for coming and look forward to working with you in the future.

The next panel is panel 5. It is old newspapers. Some of them think they are old before they get them. Mr. Glassman, Ms. Dollar, Mr. Ira Stone, and Mr. Charles Brumback, if you all would come to the table.

Mr. Glassman, I am interested in your bashing of the Washington Post because they do not do certain things. You just keep right on bashing. It is all right with me.

I see our Chairman is here now, and I will relinquish my small portion of responsibility to him. He has it all.

We had a good panel last time.

Senator **Wirth** [presiding]. Mr. Chairman, I hear it was a very, very good panel and that we have two additional potential supporters of the legislation on oil recycling.

Senator **Ford**. Oh, I can only speak for myself.

Senator **Wirth**. Potential.

Senator **Ford**. I am always potential.

Senator **Wirth**. You get greener with each passing month. It is a wonderful thing.

Senator **Ford**. I wish I could say the same for you, that you could follow my green path.

Senator **Wirth**. In any case, we thank you all very much for being here. Why do we not proceed in order?

Senator **Ford**. This is just an inside joke. I come from Kentucky, as you probably know, and I am interested in coal, and we have some problems with the Clean Air Act, and I have become in the eyes of my distinguished friend from Colorado, who is one of our stronger and more intelligent and articulate environmentalists in the Senate, he is beginning to call me greenie, because I am moving closer in his direction.

But he is just beginning to understand me. I have never been that bad, and the recycling paper that we put in place here for the Federal Government is a right interesting little proposition, and you know something? We are getting it competitive. We are getting the paper now at competitive rates, and recycling is something. Once I was convinced, we moved pretty fast.

Senator WIRTH. We appreciate all your help, Senator Ford. You have really been terrific in this.

Let me just briefly for the record introduce our panelists. Mr. James Glassman is the editor of Roll Call in Washington. Ms. Patricia Dollar, the East Coast regional sales manager for Conservatree in San Francisco; Mr. Ira Stone, senior vice president of Stone Container in Chicago, representing the American Paper Institute; and Mr. Charles Brumback, the president and chief executive officer of The Tribune Company, representing the American Newspaper Publishers. But also, Mr. Brumback is the parent of Channel 2 in Denver and the boss of John Souter, a good friend of mine.

Mr. Glassman, you are familiar—all of you are—with the rules of the committee. We would ask you to summarize your testimony in 5 minutes or less, if you might do that, and we will of course include your statements in full in the record and will leave the record open afterward for questions from various members of the committee.

Mr. Glassman, why do you not begin, and we will just move right down the table to Ms. Dollar and Mr. Stone and Mr. Brumback. Thank you all very much for being here.

STATEMENT OF JAMES K. GLASSMAN, EDITOR, ROLL CALL

Mr. GLASSMAN. Thank you, Mr. Chairman. My name is James K. Glassman. I am the editor of Roll Call, a weekly newspaper that covers the U.S. Congress. I am also the president and part owner of Levitt Communications, Inc., which is the company that owns Roll Call.

Roll Call's circulation is approximately 17,500, and we average about 32 pages per issue. As such, we are a typical small town newspaper, except that the small town that we cover is Congress and our primary readers are Members of Congress an congressional staffers.

I would like to just make two brief points and then answer any questions that you might have. The first point is that for the past year Roll Call has been printed entirely on recycled newsprint, now on 100 percent recycled newsprint, and we are extremely happy with the results.

While the paper is slightly grayer than newsprint that is made from chopped down virgin trees, the difference is barely discernible. We were warned in the early stages by some critics that color reproduction would be a problem, but it has not been. Color in our newspaper is superb, if I do say so myself, and I have brought a few examples to prove it. I will just leave them here on the table, but just as one example, you probably remember this one from last week. Here is Senator Coats playing baseball with a few other friends. Our color reproduction has been excellent.

We have extremely demanding clients, both advertisers such as Mobil, Merrill Lynch and Ford, and readers such as Members of the U.S. Congress. My wife, who is the publisher and who made the decision to use recycled stock, and I, have never had a complaint, ever, about the quality of the newsprint that we use, and we have now published about 100 issues on recycled newsprint.

Like many other small papers, Roll Call does not buy its own paper directly from a manufacturer. Our printer does the purchasing after we provide him with the specifications. Our printer is DCI Printing, Inc., of Alexandria, Virginia, which buys its recycled newsprint from Southeast Paper Manufacturing Company of Marietta, Georgia, which I believe is the largest provider of recycled newsprint in the country. DCI, our printer, also owns more than 20 weekly newspapers around Washington, and they, too, use recycled paper. They have a combined circulation of more than half a million.

Why did Roll Call decide to use recycled newsprint? Well, first, we like to think of ourselves as good citizens. Recycled paper is environmentally sound and saves energy, but second, and quite frankly it makes sense for us from a public relations point of view. Our advertisers and readers like the fact that we use recycled stock, and we have heard many compliments.

This brings me to my second point. I believe that one of the best ways for the Government to get the Nation's large newspapers to convert more quickly to recycled newsprint is to help generate public pressure on them, and one way to do this is through a labeling program such as those used to denote automobile gasoline mileage and the nutritional content of foods.

There is no doubt that we will see newspapers claiming that they are using recycled paper, the way that we saw a proliferation of inflated low cholesterol claims made by food companies, but the Federal Government can play an important role in standardizing and perhaps in disseminating information about which publications are using recycled newsprint, how much recycled content is in that newsprint, and what percentage of total paper that recycled newsprint comprises.

One final note. Many large newspaper publishers, including the Washington Post, are part-owners of paper mills. It is those publishers who must take the lead in this area. According to the Post only 5 percent of its own newsprint currently has recycled content of any sort. That figure will rise to 30 percent by 1992, according to the Post's projections.

By contrast, 60 percent of the newsprint used by DCI currently has recycled content—100 percent recycled content—and the goal of DCI is for all of its paper to be recycled by 1992.

Newspapers are enormous generators of waste paper and enormous users of energy, and I think newspapers which are fond of taking public officials and private companies to task for their mistakes and misjudgments, I think it is time for these newspapers to act in a responsible manner themselves.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Glassman follows:]

ROLL CALL
THE NEWSPAPER OF CONGRESS

The Use of Recycled Newsprint by Roll Call

Testimony by James K. Glassman, Editor of Roll Call
Before the Subcommittee on Energy Regulation and Conservation of the
Senate Committee on Energy and Natural Resources
August 2, 1990

My name is James K. Glassman. I have worked in the publishing business for more than 20 years. For the past three years, I have been editor of Roll Call, a twice-weekly newspaper that covers the US Congress. I am also the president and part-owner of Levitt Communications, Inc., the publishing company that owns Roll Call.

Roll Call's circulation is approximately 17,500 and we average about 32 pages per issue. As such, we are a typical small-town newspaper — except for the fact that the small town we cover is Congress and that our primary readers are Members of Congress and Congressional staffers.

Like many small papers, Roll Call does not buy its own paper directly from a manufacturer. Our printer does that after we provide him with the specificiations. Exactly a year ago, we changed printers, and the company that my wife Mary, who is publisher of Roll Call, chose was DCI Printing Inc. of Alexandria, Va.

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DCI suggested that Roll Call be printed on recycled paper. We enthusiastically agreed — for two reasons: First, we like to think of ourselves as good citizens. Waste paper is an enormous problem both for the environment and for energy efficiency, and by printing on recycled stock, we're doing something about that problem. Second, there is, frankly, a certain promotional value in telling our readers and advertisers that we're printed on recycled stock.

Recycled newsprint costs us essentially the same as non-recycled.

The only drawback we have found in recycled paper is that it is slightly grayer in color than paper made from virgin trees. The brightness of Roll Call when we first began with recycled stock last year was 56 (according to a system that rates reflection). Since then, the paper being produced has improved to 59. If we were using virgin stock, the brightness would be in the 65 range — not really much different.

I must tell you that in the past year of publishing my wife and I have never, literally never, received a complaint from a reader or advertiser about the quality of our paper. And in the past year we have run approximately 1,400 pages of advertising, from such demanding clients as Mobil, Merrill Lynch, Texaco, and Ford.

The paper may be slightly grayer than virgin stock, but color reproduction on it is absolutely superb. I have a few examples from recent issues of Roll Call to prove my point. I don't want to get too technical, but we are able to run ads using 133-line screens — meaning very refined photography — in color with amazing reproductive results. I have brought an example of an ad from McDonnell Douglas in this Monday's issue as an example.

Our printer, DCI, tells me that Roll Call will use 177 tons of paper this year — all of it recycled. It's important to understand that this is a good deal less than a big-city daily uses in just one day. DCI Printing itself is owned by DCI Publishing, a company that owns 21 suburban weekly newspapers in the Washington area with a combined circulation of 528,000. DCI will use 6,000 tons of paper this year printing Roll Call, its own papers, and others. Roger Silvey, the president of the company, tells me that 60 percent of the paper he uses is recycled stock. He has set a goal of 100 percent recycled paper by 1992.

DCI buys its paper from Southeast Paper Manufacturing Co. of Marietta, Ga., a firm that is jointly owned by three leading national media companies: Media General, Cox, and Knight-Ridder. Southeast will produce 450,000 tons of recycled newsprint this year — that's double what it produced two years ago. Currently five US paper mills manufacture newsprint containing 100 percent recycled paper fiber, and Southeast is the largest.

I am not an expert on the newsprint business, but it is my impression from reading the trade press and talking to my colleagues that larger newspapers and newsprint manufacturers could use a bit of a shove. As we have seen in Washington, the will on the part of citizens and government to set up recycling programs definitely exists. The problem is that the demand for used newspapers at the mills is not high enough. Until very recently, we had the ridiculous situation in this city of seeing thousands of tons of used papers, which citizens had conscientously placed on their doorsteps and the city had conscientiously collected — piling up for want of demand from mills.

Newsprint manufacturers, many of them wholly or partly owned by newspaper publishers, are balking at converting to recycled paper because of what they cite as the high capital costs involved in setting up a de-inking operation, that is, the process that pulls the ink out of used newsprint.

Since recycling is a definite public good, the question is how to get the manufacturers to speed up their conversion. I lack the technical knowledge to give any constructive comments on a specific system of recovery credits and other conservation policies, and I am philosophically opposed to local or federal governments requiring by law that newspapers use a certain amount of recycled stock. But I will say this:

The best way to get newspapers to use recycled rather than virgin newsprint is through public pressure. The government can quite appropriately help generate such pressure. One suggestion I would offer is that the federal government set standards, similar to those for food labelling, that would apply to a label or seal that could be printed on a newspaper's masthead. The label would say, "This newspaper is entirely printed on 100 percent recyled newsprint" or something similar. The federal government could run a campaign increasing public awareness of the labelling program.

Newspapers that do not carry the label would almost certainly be the object of intense public pressure to do so. Perhaps advertisers in such papers would be pressured by the public as well.

Finally, let me go back to my own area of expertise: Roll Call has found that recycled newsprint is at least the equal of virgin newsprint in reproduction. And using recycled paper provides the added benefit of helping the environment and building goodwill.

Senator WIRTH. Thank you, Mr. Glassman, very much. I want to come back to a couple of issues, if we can, but let us move on down the panel.

Ms. Dollar.

STATEMENT OF PATRICIA DOLLAR, EAST COAST REGIONAL SALES MANAGER, CONSERVATREE PAPER CO.

Ms. DOLLAR. Thank you, Senator Wirth and members of the committee for this opportunity to comment——

Senator WIRTH. You might want to pull that microphone right over to you. The miracles of modern technology have not reached the Senate.

Ms. DOLLAR. Thank you, Senator Wirth and members of the committee for this opportunity to comment on the Energy Production and Conservation Act of 1990. I bring Conservatree Paper Company's 14 years of experience combining environmental imperatives with developing markets for recycled paper.

We focus on high-grade papers—printing, writing and office papers—because that is the part of the industry that is both growing the fastest and using the least amount of recycled paper. However, we also sell newsprint, and we are involved in California's landmark legislation requiring newsprint consumers to buy increasing amounts of recycled paper.

While we applaud your intent to increase energy efficiency in the United States and also create markets for used newspapers, we believe that encouraging the burning of newspapers for fuel is both inappropriate as a market development tool and also inefficient in its use of resources. Newspapers, as well as high-grade papers, conserve a number of valuable natural resources when they are returned to the paper-making process as recycled fiber.

The beauty of recycling is that this savings is made not once but several times, since the fibers can be returned again and again to the paper-making contrast. In contrast, burning paper for fuel does not allow the fibers to be repeatedly used, thereby eliminating the continuing preservation of resources, and it also frequently does not produce a significant increase in energy.

Let me first explain the environmental impacts of recycling. The U.S. Environmental Protection Agency, in its first report to Congress, titled Resource Recovery and Source Reduction, found in 1974 that the production of 1 ton of recycled paper compared to 1 ton of virgin paper saves 4,102 kilowatt hours of energy, which is the equivalent of the amount of energy needed to heat and air condition a home for 6 months, 7,000 gallons of water, and 60 pounds of air pollution effluent not produced.

In addition, that same ton of recycled paper reduces landfill demand by 3 cubic yards, particularly significant since paper makes up more than 40 percent of the material found in landfills, and saves approximately 17 trees. Equally important, recycling is a less toxic and polluting both air and water method of paper manufacturing than virgin paper production.

These numbers may vary somewhat because of the increased efficiency of today's paper mills. In addition, many mills report only purchased energy as their energy use, omitting the inclusion of energy they cogenerate in their production process. However, this is still energy that is used in manufacturing, and should be counted for accurate assessments. Nevertheless, studies comparing recycling to virgin pulping and paper-making still indicate that manufacturing recycled paper produces a substantial reduction in the pressure on and damage to the environment.

We in the United States are becoming aware of the tragic mistake we have made for decade by burying in landfills what we thought was trash. In fact, we are realizing most of these materials are actually resources which could be reused to make new products. Their reuse reduces the need to cut new trees, mine new ores, use more water, create more pollution and all the other environmental costs associated with manufacturing from primary natural resources.

In addition, the reuse of these materials need not protect the environment only once. Paper fibers can be reused several times, some estimates range up to a dozen times for high-grade fibers, before they become too short to be used in new paper. At that time, they simply fall through the paper- making screen and are not incorporated into new paper. If, instead, this paper is burned, it is prevented from continuing its significant contribution to environmental savings and is, we believe, lost almost as completely as if it has been landfilled.

It is questionable whether burning paper produces a net energy benefit. Peter Love, of Middleton Associates in Toronto, Canada, reports in a March 1978 study in resources policy that, while burning newsprint may yield more energy than that saved in recycling, there is far more energy saved by recycling high-grade paper than burning it. This study ignores the fact that both newsprint and high-grade paper can be recycled more than once, increasing the environmental savings from both papers.

William Franklin of Franklin Associates reported at the Waste Paper Conference sponsored by Pulp and Paper Magazine in May 1990 that the energy required to absorb the moisture in paper was approximately equal to the energy released by burning, and therefore resulted in a zero net benefit. He advised that only the lowest value mixed paper with no alternatives for recycling be considered appropriate for burning.

We are concerned to see the emphasis in this bill on burning newsprint, since burning has so far been found to be less environmentally sound than recycling. Not only does it require more capital related energy itself, but it produces both air pollution and frequently toxic ash.

We also find it confusing and inappropriate to list de- inking as a method of compliance for the requirement that a producer or importer of newsprint shall burn for energy production or otherwise use newsprint. De-inking should be the preeminent method of use, not listed as a method of burning or otherwise using.

In summation, we believe that if this bill is intended to create markets for newsprint and other papers which are landfilled, its emphasis should be on incentives for de-inking and on creating consumer demand for the finished recycled product, not burning. This would appropriately value recycling's ability to provide continuing and significant environmental savings, including energy savings.

As the United States moves towards more environmentally-protective manufacturing and disposal methods, it is essential that methods be chosen which offer the least waste and pollution and the greatest environmental benefits. We believe that recycling fits this description.

Thank you again for the opportunity to give testimony on this very complex issue.

Senator WIRTH. Ms. Dollar, thank you very much.

Mr. Stone.

STATEMENT OF IRA STONE, SENIOR VICE PRESIDENT, STONE CONTAINER CORP., ON BEHALF OF AMERICAN PAPER INSTITUTE, INC., ACCOMPANIED BY RED CAVANEY, PRESIDENT, AMERICAN PAPER INSTITUTE

Mr. STONE. Good afternoon, Senator Wirth and members of the subcommittee. My name is Ira Stone. I am senior vice president of the Stone Container Corporation of Chicago, Illinois, and I am appearing on behalf of the American Paper Institute, a national trade association of the pulp, paper and paper board industry.

I want to emphasize that the U.S. paper industry's objective is to maximize paper recycling to the fullest extent economically and technologically feasible. This unequivocal commitment to recycling is perhaps best exemplified by the industry's recently announced goal to recover for domestic recycling and export 40 percent of all paper Americans consume. That will constitute approximately 40 million tons of waste paper, nearly 50 percent more than was recovered in 1989.

In the United States, old newspapers are the second largest source of waste paper collected for recycling. Old newspapers are also the principal grade of paper collected from private residences. In 1989, approximately 5 million tons were collected, which represents roughly 37 percent of all the newsprint consumed in the United States.

In the United States, old newspapers are not just made into new newspapers. Approximately one-third goes back into newsprint production at eight U.S. mills, including Stone Containers Mill in Snowflake, Arizona. Incidentally, a major portion of the old newsprint supplied to this mill comes from Colorado.

Also, approximately one-half of old newsprint goes into the manufacture of recycled boxboard, gypsum, wallboard, facing, miscellaneous packaging papers, construction board, tissue, and, most recently, Kraft paper bags such as those you get in a grocery store. The remaining 20 percent is exported for recycling abroad.

Old newsprint recycling by domestic markets has increased almost 50 percent since 1979, and by the end of 1995, studies show that demand for old newsprint will continue to grow to roughly 50 to 55 percent of U.S. consumption. Within that time frame, we will be approaching what most experts consider to be the maximum recovery rate for reusable paper in the United States, and the major challenge for us will be on the collection of quality reusable waste, not demand by manufacturers.

Technology has also opened the door for the use of old magazines, in combination with old news, and the manufacture of newsprint with recycled content. Flotation de-inking, relatively new to the manufacture of newsprint in the United States, is one of the few ways in which the 4 million tons of old magazines consumed annually in the United States can be made into new products.

I would now like to address the specifics of the legislation before the subcommittee. In our view, it simply will not increase recycling. If we are finding a home for all we can collect, what is the justification for a Government-imposed system of credits?

Coupled with our belief that the program of credits will not increase recycling is our concern that by limiting the program to old news going into new newspapers, the credit system overlooks two-thirds of the market for old newsprint. The whole picture is further complicated by the fact that the recycling of old magazines into newsprint would not be included in the credit scheme.

With respect to energy conservation, I cannot express strongly enough the industry's opposition to those provisions of the bill which would extend the newsprint recycling credits to use by waste energy facilities.

While the industry strongly supports an integrated approach to solid waste management, including waste to energy and incineration, we do not support the indiscriminate burning of any waste paper, including old newspapers, for which there is a market or for which one is legitimately anticipated.

As such, the proposal would have extraordinarily damaging consequences for current recyclers of newsprint as well as those who have hundreds of millions of dollars of investment on the line for new recycling capacity or conversion of existing capacity.

The industry is already well on its way to recovering more old newspapers for reuse than the bill directs. We will not be doing it exactly as outlined in the proposal. However, we believe it will happen more efficiently and at less cost to the industry, its customers, and the American consumer.

While we have serious and fundamental reservations with the proposal before us, we commend your interest in expanding recycling, and we believe the future is bright. Therefore, the objectives of the industry and policy makers must be to build on the solid, market-based foundation which already exists. We look forward to working with the subcommittee in the development of sound public policies that will help us achieve that mutual objective.

Thank you.

[The prepared statement of Mr. Stone follows:]

PREPARED STATEMENT OF IRA STONE, SENIOR VICE PRESIDENT, STONE CONTAINER CORP., ON BEHALF OF AMERICAN PAPER INSTITUTE, INC.

Good afternoon. Senator Wirth and members of the subcommittee.

My name is Ira Stone. I am Senior Vice President of the Stone Container Corporation of Chicago, Illinois. I am appearing on behalf of the American Paper Institute (API), the national trade association of the pulp, paper and paperboard industry.

In addition to speaking to the provisions of S. 2923, I am pleased to have the opportunity to share our insights on paper recycling -- particularly the recycling of newspapers -- and the industry's record in energy and natural resource conservation.

The U.S. paper industry has a long and proud history in recycling, dating back 300 years when the first paper produced in this country was made from cotton and linen rags. Today, paper and paperboard account for over 80 percent of all the post-consumer material recovered in this country for recycling. To give you a sense of the magnitude of the industry's involvement in paper recycling, in 1989, 27.6 million tons of waste paper were collected in the U.S. for reuse at home and abroad. Overall, recovered paper provides over a quarter of the industry's raw material requirement.

Importantly, use of recovered waste paper is not a phenomenon of our past; it is an integral part of the industry's future growth and well-being. Of particular significance will be additional recovery and utilization of post-consumer waste paper, which API estimates will be the source of 75 percent of all paper recovered by the mid-1990's.

Across the country, substantial investments are being made by domestic producers to expand recycling capacity and to meet existing and anticipated market demand. In fact, today 48 planned expansions that utilize recovered paper -- including eight new mills -- have been publicly announced. In all, over the next three years, waste paper consumption by U.S. mills will grow at a rate twice that of virgin fiber.

I want to emphasize that the U.S. paper industry's objective is to maximize paper recycling to the fullest extent economically and technologically feasible. This unequivocal commitment to recycling is perhaps best exemplified by the industry's recently announced goal to recover -- for domestic recycling and export -- 40 percent of all paper Americans consume. That will constitute approximately 40 million tons of waste paper, nearly 50 percent more than was recovered in 1989. Reaching that goal will require, for example, the collection of roughly half of the newspapers printed, two-thirds of the corrugated boxes produced, and half the high-grade white paper consumed in this country.

The industry has made and met similar objectives in energy conservation. Since 1972, the paper industry as a whole has reduced oil consumption by nearly 60 percent, natural gas consumption by 24 percent, and total fossil fuel and purchased energy consumption by 19 percent -- all this while production increased by more than 36 percent. In addition, almost 60 percent of the paper industry's energy use is self-generated from renewable materials such as bark, wood-wastes and by-products created during the process of pulping virgin fiber. In 1988 alone, these self-generated fuels represented the equivalent of approximately 200 million barrels of oil.

The industry's emphasis on energy efficiency has been reflected in other ways as well. The paper industry meets almost half of its own total electrical demand through cogenerated power, enough to satisfy New York City's entire electrical needs.

Further, the U.S. pulp, paper and paperboard industry is committed to the most efficient utilization of all fiber resources -- virgin or recycled -- and to the aggressive renewal of our wood fiber base. In addition to the one-quarter of our raw material requirement provided by waste paper, 35% of the fiber used to make virgin paper comes from wood waste recovered from sawmills and forest residues. As a result, less than half of the fiber used in making paper now comes from trees harvested specifically for papermaking.

Importantly, the forest that covers about a third of the United States is the nation's greatest renewable natural resource. To ensure that it is renewed, the forest industry is committed to the perpetuation of healthy forestland. That is why the individuals and companies who own and manage America's private forest plant an average of 6 million trees every day.

This replanting effort means that the United States grow's more wood than it loses every year to harvesting, insects and diseases. In every region of the country, more wood is grown than is harvested. Partly because of this strong stewardship record, the nation has over 20 percent more trees today than it did 20 years ago.

U.S. Newsprint Recycling

Because of the subcommittee's specific interest in the recycling of newspapers, I will narrow the remainder of my comments to that particular area and provide comments on the bill.

First, it is important that we clearly understand what happens to old newspapers in this country. One often hears, for example, that the United States recycles less than 15 percent of its newspapers. That is an inaccurate and, therefore, a misleading statistic.

In the U.S., old newspapers are the second largest source of waste paper (behind old corrugated) collected for recycling. Old newspapers also are the principal grade of paper collected from private residences. In 1989, approximately 5.08 million tons were collected, which represents roughly 37 percent of all the newsprint consumed in the U.S. When you consider that 57 percent of the newsprint consumed in this country is imported from Canada, the amount of newsprint collected was the tonnage equivalent of 82 percent of domestic newsprint production (6.1 million tons).

Even these numbers, however, do not tell the complete story. In the U.S., old newspapers are not just made into new newspapers. Of the roughly 5 million tons of newspapers collected, approximately one-third goes back into newsprint production at 8 U.S. mills, including Stone Container's mill at Snowflake, Arizona. Approximately one-half goes into the manufacture of recycled boxboard, gypsum wall board facings, miscellaneous packaging papers, construction board, tissue and, most recently, Kraft bags such as those you get at the grocery store. The remaining 20 percent is exported for recycling abroad.

Old newsprint (ONP) recycling by domestic markets increased almost 50 percent since 1979, and by the end of 1995, studies done for API show that the demand for old newsprint will continue to grow to roughly 50-55 percent of U.S. consumption. At that point, as I mentioned earlier, roughly one of every two newspapers read in the United States will have to be collected to meet the demands of the domestic recycling industry and the export market. In order to reach this nationwide average, many areas such as the urban East and West Coast areas will have to achieve 60-65 percent recovery rates. Within that timeframe, for newsprint and most other grades of waste paper, we will be approaching what most experts consider to be the maximum recovery rate for reusable paper in the United States. As a frame of reference, Japan, with a population density 15 times that of the U.S., achieves around a 60-65 percent newsprint recovery rate as a result of demographics and extremely aggressive collection and recycling programs. As we move to the maximum recovery rates for this country, the major challenge for us will be on the collection of quality, reusable waste paper, not demand by manufacturers.

Over the years, recycled newsprint has been made by deinking old newspapers through a washing process. This technology was, for all practical purposes, constrained to using old newspapers with a very limited amount of inserts and supplements included because they were folded into the papers as part of the collection process. The pulp derived after the inks are washed away is either used exclusively or in combination with virgin pulp to make recycled content newsprint.

However, just as we are seeing dramatically increasing demand for old newspapers for a variety of end uses, technology has opened the door for the use of old magazines in combination with old news in the manufacture of newsprint with recycled content. The application of this alternative process of deinking, known as flotation, is relatively new to the manufacture of newsprint in the United States. It relies on a physical-chemical process of separating materials, such as inks and the clay they are printed on, from fiber. The clay coatings used in magazines help "float" off the ink, and are essential to proper operation of the system. Flotation deinking, in fact, is one of the few ways in which the 4 million tons of old magazines consumed annually in the U.S. can be made into new products. Because all new deinking systems for newsprint manufacture currently announced in North America will utilize flotation, generally in combination with washing of ONP, magazines will play an increasing role along with old newspapers in the manufacture of newsprint with recycled content.

All paper recycling technologies, however, share a common need for never-before recycled fibers. The cellulosic fibers in paper break down with repeated recycling and at some point will no longer form a sheet of paper. As a result, new virgin fiber must be continually introduced into the overall fiber supply to replace those fibers that are rendered no longer usable and to enhance the properties and characteristics of those that are reusable.

It is important to note that, while we are very optimistic about the future utilization of and the demand for old newspaper, we do anticipate short-term market dislocations.

We know that, increasingly, old news will become available because of mandatory neighborhood or citywide source separation and collection programs, which bring large volumes of ONP on the market all at once. Considering that 75 percent of the United States population lives in metropolitan areas with an average population of 700,000 people, the start of citywide collection programs can have a dramatic short-term impact on old newsprint markets. For example, Philadelphia, Los Angeles, New York City and Chicago all intend to implement citywide collection programs in the near future. Collectively, these programs could add almost one-million tons of old news to the market each year. To look at it another way, a new deinking facility capable of recycling 200,000 tons per year of ONP would be needed for each city with more than 2 million households if the newsprint market were to absorb all of this fiber. Since, after first finding a suitable site, it takes approximately three years to permit and build a new mill and only slightly less time to convert a facility, timing alone leads to inevitable dislocations. Nonetheless, while information has always been spotty, we believe at its highest level, the over-supply of old news probably has never exceeded 500,000 tons and now, according to researchers, is closer to 200,000 tons -- as compared to the almost 5 million tons of old news collected each year and over 27 million tons of waste paper collected each year. The point is, these temporary over-supply situations are not of the magnitude to indefinitely overwhelm the system.

In addition, as I have pointed out, the market for old news is not confined to newsprint manufacturing. With adequate planning and partnerships between municipalities and manufacturers, these problem times can be minimized. In addition, emphasis on consumer and publisher education can play a vital role in assuring that the newspapers collected are of the highest quality and have a minimum of impurities such as address labels, stickers, and plastic coated materials. API and the American Newspaper Publishers Association have a joint technical committee to work on these matters from the business side. Care in collection can further enhance the potential for an expanded universe of markets.

The paper industry has also found that municipalities can benefit from more information about potential markets for recovered material. This summer, API will issue a nationwide directory listing paper recycling mills, waste paper dealers and recycling centers. We believe this new directory will be invaluable to communities that want to implement successful paper collection systems.

Comments on S. 2923

I would like now to address the specifics of the legislation before the subcommittee. Our analysis of the bill leads us to the view that the primary objective of the legislation is to increase recycling -- specifically to increase the recycling of old newspapers -- an objective we all share. From that objective, the bill would hope to achieve energy and natural resource conservation and ease the solid waste management and disposal burdens upon municipal governments -- again specifically as they are linked to newspapers. These, too, are objectives we all share.

The challenge, then, is to determine whether or not the program outlined in the bill will accomplish these objectives more efficiently than existing marketplace mechanisms.

First, will it increase recycling? In our view it will not. As I noted, over 37 percent of all old newspapers are now being recovered for use here and abroad. In less than five years, collection will jump to over 50 percent, with capacity and markets -- both domestic and international -- on stream to handle it. In fact, as the data provided to the Subcommittee indicate, demand and capacity will out pace supply as we approach the practical limitations of collection in the United States based on a variety of factors, including U.S. demographics.

Coupled with our belief that the program of credits will not increase recycling, is our concern that by limiting the program to old news going into new newspapers, the credit system overlooks two-thirds of the market for ONP -- both domestic and international. This could result in extremely unproductive market dislocations as manufacturers and importers try to siphon off a diminishing supply of recyclable newsprint from existing markets such as box board, tissue and the like, which already provide efficient markets for ONP. Without these alternative markets, many manufacturers are concerned that too high a percentage of recycled fiber will be forced back into the newsprint system too many times.

The whole picture is further complicated by the fact that the recycling of old magazines into newsprint would not be included in the credit scheme. Not only would this disregard alternative recycling technology, it also would ignore one of the few markets for a post-consumer waste now inevitably destined for landfill or incineration.

Next, does the bill achieve energy and natural resource conservation more efficiently than existing marketplace mechanisms? Again, we have serious reservations. Keeping in mind that we believe there will be a home for all the usable waste paper that can be collected, we must raise questions about the energy savings referenced in the bill. While the bill points to a 64 percent savings of recycled production over virgin, energy audits in the U.S. and Canada would point to savings more generally in the range of 20-30 percent, and even that gap will narrow by individual mill comparisons. Specifically, we find the energy estimates referenced in the bill more than double the actual requirements for virgin newsprint production.

The industry is, as I noted, extremely proud of the energy savings achieved over the last 20 years -- both in virgin and recycled production. We work continually to achieve more -- both in what we purchase and self-generate. It is not our view that his proposal would enhance those efforts.

With respect to energy conservation, I cannot express strongly enough the industry's opposition to those provisions of the bill which would extend the newsprint recycling credits to use by waste-to-energy facilities. While the industry strongly supports an integrated approach to solid waste management, including waste-to-energy and incineration, we do not support the indiscriminate burning of any waste paper, including old newspapers, for which there is a market or for which one is legitimately anticipated. As such, the proposal would have extraordinarily damaging consequences for current recyclers of newsprint as well as those who have hundreds of millions of dollars of investment on the line for new recycling capacity or conversion of existing capacity.

In the area of natural resource conservation, the industry's record speaks for itself. The entire paper industry, both virgin and recycled production, depends on the tree as its initial fiber source. We are all mindful of that dependency and work every day to ensure that we get maximum use of all our fiber sources and continually replenish it.

Finally, does this bill do anything to lessen more efficiently the burden on all of us for responsibly managing and disposing of solid waste? Regrettably, in the paper industry's view it does not. The industry is already well on its way to recovering more old newspapers for reuse than the bill directs. We will not be doing it exactly as outlined in the proposal, rather, we believe it will happen more efficiently and at less cost to the industry, its customers and the American consumer.

The further good news for municipalities is that waste paper in general, not just old newspapers, will be handled far differently in the future. In 1995, for example, half of all the paper Americans use will be diverted or recovered for recycling; in 1988 just over 40 percent was. And significantly, in 1995 just over a third of all the paper we consume will be sent to landfills; over half was buried two years ago.

These important changes depend primarily on a substantial increase in paper recycling. Making this goal reality will require a cooperative effort among industry, government and individual citizens.

So while we have serious and fundamental reservations with the proposal before us, we applaud the subcommittee's interest. A commitment to addressing the challenge before us can work to the mutual benefit of all.

Enclosed for the subcommittee's review are several items providing further background on many of the points made in this statement, including a Franklin Associates, Ltd. report entitled "Paper Recycling: The View to 1995."

In conclusion, we appreciate the invitation to appear before the subcommittee. We do commend your interest in expanding recycling. We believe the future is bright. Both the collection and use of waste paper are growing -- and growing impressively. The infrastructure, consisting of an efficient, interdependent network of collectors, suppliers, producers and customers is already in place to further maximize recycling.

Therefore, the objective of the industry and policymakers must be to build upon the solid, market-based foundation which already exists. We look forward to working with the Subcommittee in the development of sound public policies that will help us achieve that objective.

DATA ON U.S. PAPER RECYCLING

Overall

27.6 million tons of waste paper were collected in the U.S. for reuse at home and abroad in 1989

Over 25 percent of the U.S. paper and paperboard industry's raw material requirement is provided by recovered paper

40 million tons of waste paper will be recovered in 1995 for reuse here and abroad according to U.S. paper industry projections

Newsprint

6.1 million tons of newsprint were produced in the U.S. in 1989

5.08 million tons of newsprint were recovered in the U.S. in 1989, equally 37 percent of U.S. consumption (57 percent of newsprint consumed in the U.S. is imported from Canada).

> One-third of recovered old newspaper goes back into the production of newspapers
>
> One-half goes into the manufacture of recycled boxboard, gypsum wall board facings, miscellaneous packaging papers, construction board, tissue and kraft bags
>
> One-fifth is exported for recycling abroad

50-55 percent of old newspapers will be recovered for recycling here and abroad, according to Franklin Associates projections, in 1995

U.S. NEWSPRINT MILLS BY STATE

Alabama

Kimberly-Clark Corporation	Coosa Pines

Arizona

* Stone Container Corporation	Snowflake

California

* Golden State Newsprint Company Inc.	Pomona

Georgia

** Augusta Newsprint Company	Augusta
* Southeast Paper Manufacturing Company	Dublin

Illinois

* FSC Paper Corporation	Alsip

Louisiana

Boise Cascade	DeRidder

Maine

** Georgia-Pacific Corporation	East Millinocket

Michigan

* Manistique Papers Inc.	Manistique

Mississippi

Newsprint South Inc.	Grenada

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* U.S. mills that utilize old newspapers as all or part of their fiber requirements

** Publicly announced new deinking capacity

8/1/90

New Jersey

*	Garden State Paper Company	Garfield

Oregon

	James River Corporation	Wauna
*	Smurfit Newsprint Corporation	Newberg
*	Smurfit Newsprint Corporation	Oregon City

South Carolina

	Catawba Newsprint Company	Catawba

Tennessee

**	Bowater Southern Company	Calhoun

Texas

	Champion International Corporation	Lufkin
**	Champion International Corporation	Houston

Virginia

	Bear Island Paper Company	Ashland

Washington

	Inland Empire Paper Company	Millwood
**	North Pacific Paper Company	Longview
	Ponderay Newsprint Company	Usk
	Boise Cascade Corporation	Stellacoom

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* U.S. mills that utilize old newspapers as all or part of their fiber requirements

** Publicly announced new deinking capacity

8/1/90

Senator WIRTH. Mr. Stone, thank you very much.
Mr. Brumback.

STATEMENT OF CHARLES T. BRUMBACK, PRESIDENT, THE TRIBUNE CO., ON BEHALF OF THE AMERICAN NEWSPAPER PUBLISHERS ASSOCIATION

Mr. BRUMBACK. Mr. Chairman, I am president of the Tribune Company, which is a diversified media company publishing seven daily newspapers in Chicago, New York, Florida, California and Virginia; six independent television stations in New York, Chicago, Los Angeles, and John Souter's stations in Denver, New Orleans, and Atlanta; four radio stations; and the Chicago Cubs. In addition, we are manufacturers of recycled newsprint in Ontario, Canada, and also have a mill in Quebec which manufactures virgin newsprint.

I will not ask you to trust us and give you promises about newspaper publisher usage of recycled newsprint. I ask you to look at the facts and the trend over the past year and a half.

The newspaper business is fully committed to using more and more recycled newsprint. Publishers are buying recycled newsprint because it makes good business sense. A recovery credit system imposed on the newsprint market at this time would be disruptive and have negative effects. Our industry opposes such a system for newsprint.

Let me highlight some of the actions of our business in support of recycling: (1) ANPA urged its members to double their recycled newsprint use from 14 to 28 percent of total purchases by 1992. Publishers have insisted that newsprint mills provide them with more recycled newsprint.

(2) As a result, a dozen newsprint mills have made firm capital investment decisions to increase their recycled newsprint capacity to over 5 million tons, or 35 percent of capacity, over the next 3 years. This marks a 155 percent increase over 1989 figures.

(3) Mills have spent or committed $1.5 billion to expand recycled newsprint capacity since 1988.

Concern about an oversupply or glut of old newspapers is exaggerated. ONP again is being actively sought by recyclers. Recent developments include a reported price increase for ONP in the Northeast, new contracts for the sale of ONP by two of the Nation's largest waste haulers, and the July 3 announcement to sell old newspapers collected by the District of Columbia to Capital Fiber, Inc., which is 90 percent owned by the Washington Post.

Remember that demand for ONP comes from other than newsprint mills. In 1988, two-thirds of the 4.2 million tons of old papers that were recovered were devoted to uses other than marketing recycled newsprint. Tribune Company's mill in Ontario, which has been making recycled newsprint since 1982, finds itself competing for ONP more than ever before. This week, ANPA released the results of a Franklin Associates study that finds that we lack good data for the amount of ONP generated and collected. This data is essential to support additional investment in recycling capacity. According to experts such as the American Paper Institute and the

National Solid Waste Management Association, there likely will be a shortage of old newspapers by the year 2000.

Mr. Chairman, against this background in today's newsprint market, we respectfully submit that the recovery credit system is unnecessary, could disrupt the market, and be counterproductive to the overall goal of increased recycling. Following are the reasons:

First, creating a new regulatory scheme now will upset the market once again. Investors and corporate planners are likely to halt development in construction of expanded recycling capacity.

Second, a recovery credit system would create a new market for intangibles but would not increase production of recycled newsprint.

Third, the recovery credit system would impose a new administrative burden on the mills and newspapers. Some mills might even cease producing newsprint, or shift to other products.

Fourth, why create a whole new Federal bureaucracy when the market has already responded and made a $1.5 billion investment commitment?

Mr. Chairman, we do not believe that a recycling credit system is needed in the newsprint market. When projects come on line in 1992, capacity for recycled newsprint will have grown 155 percent since the end of 1988. Newspapers have demonstrated that they are ready purchasers of recycled newsprint. We ask you to allow the free market to continue its work.

Thank you.

[The prepared statement of Mr. Brumback follows:]

PREPARED STATEMENT OF CHARLES T. BRUMBACK, PRESIDENT, THE TRIBUNE CO., ON BEHALF OF THE AMERICAN NEWSPAPER PUBLISHERS ASSOCIATION

Mr. Chairman, I am the President of Tribune Company, a diversified media company engaged in newspaper publishing, broadcasting, entertainment production, and newsprint operations.

Today I am representing the American Newspaper Publishers Association (ANPA). I am a director of ANPA and also chairman of its Government Affairs Committee. ANPA represents more than 1,400 newspapers, over 90 percent of the daily circulation in the United States.

I am not here today to tell you to "trust us" and give you "promises" about newspaper publisher usage of recycled newsprint. I am asking you to look at the facts and the trend line over the past year and a half. The newspaper business is fully committed to the increased use of recycled newsprint. There are no issues of quality. Recycled newsprint is as good as virgin newsprint. In addition to public policy concerns, publishers are buying recycled newsprint because it makes good business sense.

Mr. Chairman, the imposition of a "recovery credit" system on the newsprint market at this time would be disruptive and have other negative effects.

Let me highlight the actions of our business:

- In September 1989, ANPA adopted a strong policy in support of recycling. This past year newspapers have insisted that newsprint producers provide them with more recycled newsprint. In April of this year, ANPA urged its members to double their recycled newsprint use from 14 to 28 percent of total purchases by 1992.

- As a result, a dozen newsprint mills have made firm capital investment decisions to increase their recycled newsprint capacity to over five million tons over the next three years. This marks a 155 percent increase over 1989 figures.

- As of this week, we can now account for $1.5 billion spent or committed to expand recycled newsprint capacity since ANPA began its

Newsprint Resource Project in 1989. A list of the mill investments is appended to my testimony. A number of ANPA's members are equity partners in these ventures.

- The increasing capacity projections already have outstripped the April ANPA Board goal and newspaper publishers stand ready to purchase the increasing amount of recycled newsprint as it becomes available. In six states publishers have entered into specific voluntary agreements with state officials to increase their purchase of recycled newsprint (New York, Massachusetts, Michigan, Pennsylvania, Vermont and Iowa). For example, in New York state, newspaper publishers, including the New York Times, Newsday, the New York Daily News and the Wall Street Journal, have voluntarily committed to use 40 percent recycled fiber on an annual aggregate tonnage basis by the year 2000.

During the late 80's, expansion in the collection programs did result in an excess of old newspaper (ONP) supply in some localities. With falling prices for used newspapers came various proposals to artificially create markets for ONP. However, mill recycling expansion is in response to publisher demand, not legislation, and now the market for ONP is stabilizing. Of course, some lead time is involved. A new recycled newsprint mill can take five years to site and build and can cost over $300 million. Installing a de-inking facility at an existing mill is less expensive, usually $25-100 million and can still take as many as two years.

Laidlaw Waste Systems of Burlington, Ontario, is offering $25 a ton for old newspapers, and looking to sign 20-year contracts with municipalities in New York and other northeastern states. This ONP will be used to stock the new $175 million de-inking investment Canadian Pacific has made at its Thunder Bay, Ontario and Gatineau, Quebec mills due to come on line in 1991.

On July 3, the District of Columbia announced an agreement to sell its old newspapers for $10 a ton, as part of a five-year contract with Capitol Fiber, Inc., which is 90 percent owned by the Washington Post, the rest by Canusa Corp., a Maryland-based waste paper processor.

Both of the nation's largest waste haulers, Waste Management, Inc., and Browning Ferris Industries, Inc., have just announced contracts to sell their collected newspapers to recycling mills in the U.S. More agreements of this sort are likely as newsprint mills arrange for long-term supplies of used newspapers.

The long-term problems in the recycled newsprint market are not a lack of mill expansion or publisher demand. Any long-term problems that exist relate to the actual amount of ONP likely to be available to stock mills' ever increasing recycling capacity and poor data on ONP collection.

According to the experts, if all of the planned capacity comes on line, we face the likelihood of a shortage of ONP by mid-decade. The American Paper Institute and the National Solid Wastes Management Association have both published recent studies to this effect. Additionally, we face a lack of adequate data today on the amount of ONP actually being generated and collected. In a study released this week by ANPA, Franklin Associates found that only eight states were able to supply figures on how much used newspaper was being collected. It will be essential to know how well the public collection programs are doing, as we go forward.

Mr. Chairman, we respectfully submit that given today's newsprint market, the "recovery credit" system is unnecessary, could disrupt the market and be counterproductive to the overall goal of increased recycling.

First, a disruption would result from creating a new regulatory scheme as the capital formation process already is underway. The market would be upset once again. Investors and corporate planners -- who now are operating on one set of rules -- will see the potential of recycling credits as a changed playing field. Planning and some construction is likely to halt for a time while those involved reassess the situation.

Second, the likely result for a "recovery credit" system will be a new market for intangibles, not increased production of recycled newsprint. More money would be diverted from capital investments to generate credits.

Third, the "recovery credit" system would impose a new administrative burden upon the mills and newspapers. Smaller mills, due to the administrative burden and narrow profit margins, might even cease producing newsprint or shift to other paper products. FSC in suburban Chicago, a long-time producer of 100 percent recycled paper, recently added a new machine to make tissue paper rather than more newsprint. Additionally, as long as the importers of newsprint are newspapers, some of the burden will reside with them (57 percent of U.S. newsprint comes from Canada).

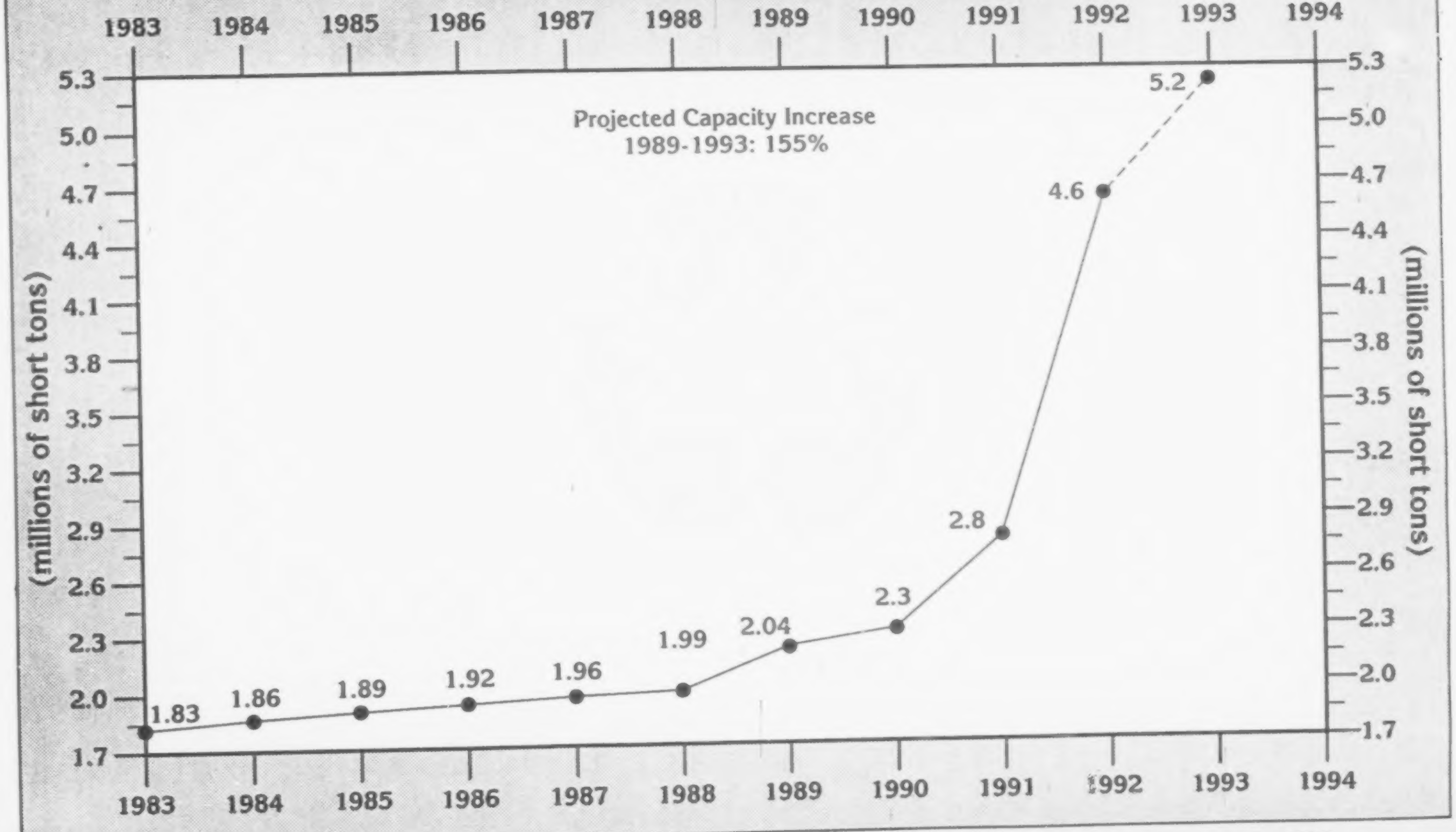
Fourth, a whole new federal bureaucracy would be needed to carry out the legislation. Auditors, economists, auctioneers, paper specialists and, of course, lawyers. How could this operation be carried out by six persons? And where would it end? Would this market be regulated in perpetuity? Why create this bureaucracy when the free market already has responded and made a $1.5 billion investment commitment?

Fifth, there is the troubling new aspect of power companies being encouraged to burn used newspapers. This would bring another huge consumer into the game and give resource recovery facilities a fierce incentive to corral all the used newspapers they can find, by the hundreds and thousands of tons, and burn them.

This will further compound the likely shortage of used newspapers. The result is counterproductive to the goal of increased recycling. A similar government preference for burning newspapers during the 1972-73 oil crisis wreaked havoc on the then infant newsprint recycling industry.

Mr. Chairman, the growth in the newspaper recycling market has been set in motion by public policy concerns, publisher action and the promise of new supplies of newspapers to recycle. We do not believe that a "recycled credit" system is needed in the newsprint market. When projects come on line in 1992, capacity for recycled newsprint will have grown 155 percent over 1989 figures. Newspapers have demonstrated that they are willing purchasers of recycled newsprint. We ask you to allow the free market to continue its work.

Recycled Newsprint Capacity in North America



Note: ANPA estimates a total U.S. newsprint market of 14.3 million short tons in 1992 and 14.6 million short tons in 1993.

Senator WIRTH. Thank you very much, Mr. Brumback.

Let me start if I might, Mr. Glassman—I would like to put in the record, I do not know if you have seen it, a letter from Boisfeuillet Jones, the vice president and counsel of the Washington Post.

He says, "In view of the publicity about the Post's use of recycled newsprint, I thought you should know what the newspaper has actually been doing. The Post got a black eye last autumn from an NBC Evening News segment that erroneously said the Post was not using any recycled newsprint, and more recently from Duncan Spencer's two Roll Call columns that wrongly said the Post really could not care less."

Anyway, I would like to include that in the record, and it might be grist for the Roll Call mill.

Mr. GLASSMAN. So to speak. He is an old friend of mine.

I am just looking at a press release that the Washington Post put out on July 3 which says that the amount of newsprint containing recycled content used by the Post is expected to grow from 5 percent today to 20 percent late this year, and so forth, and 30 percent in 1992. It may be incorrect that the Post was using zero recycled content paper, but according to its own press release it is only using 5 percent right now.

I do not mean to be specifically critical of the Post, but I am a resident of the District of Columbia, and I dutifully wrap up my newspapers and put them out on my doorstep on Thursdays, and the fact is that the Department of Public Works of the District, in a press release on July 3, admitted the city has marketed 50 percent of its collections. That is all.

There are tons and tons of papers that have been piling up that have not been sold, so the idea that there is this tremendous demand for ONP I do not think is true. Now, it may be increasing. Certainly it is increasing, but it does not exist right now.

My only point—and I do not want to single out the Washington Post, but my only point is that a lot of these larger newspaper companies do own their own mills, or are part owners of mills, and if part of the problem is that the mills have not converted to the point where they can handle ONP, then I think part of the blame has to reside with the larger newspapers.

Senator WIRTH. The Post uses now 5 percent, and it is growing, says Mr. Jones' letter. Do you have any idea what percentage the New York Times uses?

Mr. GLASSMAN. I do not. I do not know, I really do not.

Senator WIRTH. Do you know about the Los Angeles Times?

Mr. GLASSMAN. No.

Senator WIRTH. Do any of you know what the numbers are?

Mr. BRUMBACK. It ranges anywhere from—the New York Times is around 5 percent right now. Chicago Tribune this year will be 46 percent; the Chicago Sun Times, 46, 47 percent; Denver Post, 50 percent; Rocky Mountain News, 22 percent; and I think the Los Angeles Times claims around 70 percent, if not more.

Senator WIRTH. Why are there these enormous differences? Past contracts, Mr. Brumback, printing machinery?

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* See Appendix.

Mr. **Brumback**. Past contracts and the availability of old newspapers to recyclers.

I would like to correct the earlier statement that, as far as newspaper publishers owning their mills and not having interest in recycling, all of the recycling capacity today for newsprint was started, or was owned at one time or another, by newspaper publishers.

The Scudder family, which owned the Newark newspaper, started the Scudder process, which is a major pioneer for, I think, 30 years anyway.

The Los Angeles Times, the reason it is so high is that it at one time owned a newsprint operation that is now a major recycler on the West Coast.

Our company, we have today the only recycling operation in Canada, in Ontario.

Senator **Wirth**. Let me ask another question. Why, say, are you at 50 percent and the New York Times is only at 5? There is not available the recycled newsprint, or there is not available enough old newspapers?

Mr. **Brumback** It is not available.

Senator **Wirth**. Which is not available?

Mr. **Brumback**. The recycled newsprint. There is capacity, as I said earlier there is capacity under construction that will be finished in a couple of years.

Senator **Wirth**. What would that take it up to?

Mr. **Brumback**. That is going to take it up to over 30 percent; 35 percent of the newsprint capacity in North America would produce recycled newsprint.

Senator **Wirth**. If, however, some newspapers are using 80 or 90 percent, why should the target not be 80 to 90 percent recycling rather than 30 percent?

Mr. **Brumback**. When industry--American Newspaper Publishers Association—set the 28 percent goal, that was the limit of the known recycled newsprint capacity that was planned or anticipated by the end of 1992. We wanted to make it clear as an industry that we would take all recycled newsprint that is produced, and that was the 28 percent goal that is now going to be well over 30 percent.

Senator **Wirth**. But is not the public policy goal to increase the amount of recycled newsprint available? We ought to say, rather than having that goal set by your 28 percent, why should we not say that the goal ought to be 80 percent? I mean, why should the United States Congress assume that the goal ought to be set by the newspaper publishers and what you all think it ought to be?

Mr. **Brumback**. I am not sure it is the business of the Congress to set goals for newspapers.

Senator **Wirth**. Wait a minute. Let us back up. Is it our responsibility to set goals for clean air?

Mr. **Brumback**. I think that is reasonable.

Senator **Wirth**. Is it our responsibility to set goals for clean water?

Mr. **Brumback**. I think that is probably reasonable.

Senator **Wirth**. Is it our responsibility to set goals for landfill operations?

Mr. **Brumback**. I am not sure.

Senator **Wirth**. Who has the responsibility for saying what we ought to do is to diminish the amount of landfill and increase the amount of recycling? Is that a legitimate goal for us to set?

Mr. **Brumback**. I am not sure if that is a Federal goal. I think there is a lot of local input that is involved. There are some areas where there are problems with landfills, and there are other areas where there is no problem.

Senator **Wirth**. Is it our responsibility to set a goal on how much timber ought to be cut in the United States?

Mr. **Brumback**. I am not sure.

Senator **Wirth**. Is it our responsibility on the Federal forests to say that we ought to cut less timber rather than more timber? Can we set that kind of a goal?

Mr. **Brumback**. I would think so.

Senator **Wirth**. Now, why can we not say what the national goal ought to be related to recycling? Should we be saying that there ought to be national recycling goals, do you think?

Mr. **Brumback**. For newsprint?

Senator **Wirth**. As a general proposition, that we ought to recycle aluminum?

Mr. **Brumback**. As far as it is a good thing to recycle aluminum.

Senator **Wirth**. Or to set targets for where we ought to go in terms of recycling?

Mr. **Brumback**. I do not know. I am not in the aluminum business, and so I cannot really respond.

Senator **Wirth**. We are talking about legitimate public purposes. I was picking up on your statement that that is not a legitimate sort of thing that we ought to do as a government. Is it a legitimate public purpose to set a goal for recycling aluminum?

Mr. **Brumback**. I really cannot answer that.

Senator **Wirth**. You are getting yourself cornered, and you can see that, right?

Mr. **Brumback**. I saw that when you first started.

Senator **Wirth**. You saw that coming. Okay. I do not think that is a particularly sound route to pursue. I mean, I would not get myself in that corner, if I were you. We set public policy goals all the time, and it is increasingly happening that the people of this country are saying, we want to recycle. I mean, I hear that everywhere.

One of the frustrations is, people say, I put my newspapers out every Thursday morning, and I am not only going to the trouble of putting them out every Thursday morning, but then they get picked up and they go into the landfill over here, because there is no place for those newspapers to go. I mean, if I hear that one time, I have heard that a hundred times, in town meetings in Colorado.

So they say, why do you guys not do something about making sure that the newspaper I am reading, the Rocky Mountain News, uses more than 22 percent? To which I say well, the newspaper publishers have said there is only a goal of 28 percent. That is as far as we ought to be going. How would you respond?

Mr. **Brumback**. Senator, I would respond to that by encouraging you to work with the recycling effort. You are right, people want to recycle.

Senator **Wirth**. But it is not a legitimate public policy to get concerned with recycling.

Mr. **Brumback**. We are not going to get where you want to get unless the local communities set the garbage separation, get that going, have data that keeps track of what they are doing, and has the system in place that will permit those old newspapers to get to the recycler. As of now, that does not exist.

Senator **Wirth**. There is a disconnect. Let me tell you, there is an enormous disconnect. In Boulder, Colorado, there is a major recycling program called Ecocycle. They have been recycling for 15 years, and the problem is that the bottom of the market has dropped out of newspapers, which used to be important, because now everybody is collecting newspapers and putting them out on the street corner every morning—every Thursday morning. Now the community is being wonderfully responsible. Their problem is, there is no market out there for that, so they dutifully collect the newspapers, and they drop in the landfill.

Mr. **Stone**. Senator, if I might, it takes about 3 years to get permits for a new recycled mill from the day you start, and about as long to convert an existing mill, so there is some time lag between the ability to recycle and the collection.

We are collecting about 5 million tons of old newsprint a year right now, and we think that by 1995 we are going to be collecting virtually one out of every two newspapers read by Americans, and our studies indicate that that is probably the maximum limit of technologically feasible collection in the United States.

Senator **Wirth**. When were those studies done, Mr. Stone?

Mr. **Stone**. Those were done by API earlier this year.

Senator **Wirth**. They were completed earlier this year? When was the data collected on those?

Mr. **Cavaney**. The data was collected late last year and earlier this year by Mr. Franklin. The information was provided to the EPA as well.

Senator **Wirth**. Who is Mr. Franklin?

Mr. **Cavaney**. He is EPA's consultant, particularly in the area of paper recycling, and has done so for 15 years.

Senator **Wirth**. My instinct tells me that that is flat wrong, that 50 percent was all that could be done. I would guess that the public is changing so rapidly and that the demand for landfill space is becoming so high and so expensive—I mean, I cannot believe, if the Los Angeles Times, as Tom Johnson told me, is using 90 percent and you are saying all we can do is collect 50 percent——

Mr. **Stone**. The country that is most successful in recycling in the world today is probably Japan, because they do not have resources. They have a very dense population situation, and they have a very aggressive collection campaign, and they collect 50 to 55 percent.

Mr. **Brumback**. Senator, the landfill problem is—about 6 to 8 percent of the landfill volume is old newspapers.

Senator **Wirth**. I have heard there is no problem, as well, with tires, because they are only 1 or 2 percent. You know, we can dismiss everything that goes into a landfill because it is only a small percentage of what goes into the landfill, and we can sort of wish away all the landfill problems.

Mr. **Brumback**. Thirty-five percent is paper products, direct mail packaging, boxes, things like that. Of that, 8 percent is old newspapers.

Senator **Wirth**. Well, let me ask you a question, if I might, Mr. Glassman. Do you have any idea what the difference would be in energy usage between, say, the New York Times, if the New York Times used 90 percent recycled paper versus the 5 percent that they use now in a given year? Could that be calculated, do you suppose?

You are making the point that recycled paper is much more energy efficient, is that correct?

Mr. **Glassman**. I believe—I am not an expert in this field. This is just based on what I have read, so I am probably not the best witness on this. I know that one problem—my understanding is that the process is less energy intensive to produce recycled newsprint.

The problem, however, is transporting the old newspapers to these mills, which are very, very far away, and this is one of the incentives that, as I understand it, and one of the reasons that I think that many current mill owners have been somewhat reluctant to make this transition in a speedy way.

They have already made an investment way up in Canada, and the idea of moving newsprint from Washington to Canada is expensive and is energy intensive.

Mr. Chairman, I just wanted to make one other point, and that is on this business about percentage of newsprint, recycled newsprint that is used, in particular, newspapers. The content of that newsprint may be 10 percent, 35 percent or 100 percent recycled fiber, and I think that is an important distinction. That is why I sort of brought up this labeling business. I do not know what it is for the Los Angeles Times.

In other words, when they say they use 70 percent recycled newsprint, well, that recycled newsprint may not be 100 percent made from old newspapers. I am not sure. Maybe Mr. Brumback might be able to clarify that. I do know that our newsprint is 100 percent recycled, but it was not originally. It was originally 35 percent.

Senator **Wirth**. What you are saying is that recycled paper may come from a source—or, the recycled newsprint may come from sources other than old newspaper?

Mr. **Glassman**. Correct.

Senator **Wirth**. It comes from the trimmings of paper and so on, is that correct? I was talking ahead of the General Printing Office.

Ms. **Dollar**. It is a ground wood content fiber. Any time you have a ground wood content—for example, old magazines which are made with ground wood—they could potentially be included, and one of the points that I would like to make in the percentage figures that you are talking about, 80 percent, in the paper-making process, you always have to have some virgin fiber in order to maintain the integrity of the paper.

If you continually have recycling, you will end up with a rather incestuous system and the quality of the fiber is reduced with each recycling process, so it is difficult to achieve an 80 percent rate and still maintain a proper quality sheet that is not going to break on the web presses, et cetera and so forth.

Senator **Wirth**. How does that differ from your experience?

Mr. **Glassman**. I frankly do not know. All I know is—and again, I am not the expert.

Senator **Wirth**. So no recycled paper has enough——

Mr. **Stone**. I suspect 100 percent recycled paper is in fact 100 percent, but the fiber content of that paper is not 100 percent recycled. The fiber content is probably 25 percent, or 30 percent recycled.

Senator **Wirth**. Where does the other 75 percent come from?

Mr. **Stone**. From virgin pulp.

Ms. **Dollar**. But you could conceivably make a sheet that is 100 percent recycled newsprint. The thing to be careful of in doing this is, if you legislate that all newspaper must be recycled, then you are putting the industry at a disadvantage in being able to produce a quality product. You always have to have some virgin fiber to add, even to your recycled product.

A mill could be, for example, making 100 percent recycled newspaper, but that paper that they are getting has gone through different stages of recycling and it can be reused continuously until the fiber particles are too small to make paper.

Senator **Wirth**. We are at 34 percent, I think, in this legislation.

Ms. **Dollar**. We are talking about 34 percent of the industry, as opposed to 34 percent of the content of the paper. Are we speaking the same language here? Thirty-four percent of the industry?

Senator **Wirth**. We are talking about 34 percent of the industry.

Ms. **Dollar**. Not the content of the paper. So if you increase it to 80 percent of the industry, then you are going to create, by virtue of doing that, an incestuous process in paper making which is going to reduce the quality of the paper.

Senator **Wirth**. Eventually. You have to introduce virgin stock along the line. I understand that.

Ms. **Dollar**. You have this problem in Europe, in the papermaking process. They do a tremendous amount of recycling there, and they do find that if they do not introduce virgin fibers, or fibers that are at a higher stage in the recycling process—in other words, the fibers are still longer and stronger—then if they do that, it depletes the quality of the paper. It literally reduces it.

So you have to continually allow for some virgin fiber, and your 80 percent figure for the industry is too high to allow for this regeneration of product and quality level.

Senator **Wirth**. Do you all agree with that?

Ms. **Dollar**. But you can still make the 100 percent recycled paper.

Mr. **Stone**. Eighty percent recycled for the industry I think would be unrealistic.

Senator **Wirth**. Now, where does the 80 percent number come from?

Ms. **Dollar**. It is your number. You said that you wanted to achieve——

Senator **Wirth**. I said, what is the problem with 80 percent?

Ms. **Dollar**. You can have different grades.

Senator **Wirth**. But there is different material built into the Los Angeles Times, is what you are saying. It is not 80 percent old newspapers. Is that right?

Ms. **Dollar**. It is not 80 percent.

Mr. **Cavaney**. I think I can clarify. You can comfortably make 100 percent recycled newsprint and it can be used with as good a quality.

Senator **Wirth**. Would you identify yourself?

Mr. **Cavaney**. My name is Red Cavaney with the American Paper Institute, and I am accompanying Ira Stone, here.

But what you need to do in the overall entire United States, you cannot have all sheets be 100 percent recycled, because what happens without the virgin paper, the fibers will not bond and you cannot form a paper sheet, so you are going to need to have a range that comes out at the high end and some possibly a little less, and that number depends on the kind of fiber that is used and a whole range of things that do not lend themselves to being able to be specifically legislated.

Our goal is to be able to collect and use every old newspaper we can get our hands on, and the path that we are moving towards is headed in that direction. The difference is the lag time between when you can start up a collection system and when we can actually convert a mill to use recycled newsprint, because you cannot automatically introduce old newsprint into a virgin mill without significant changes and additional equipment and permit allowances.

Senator **Wirth**. What would happen, Mr. Stone, if the price of timber from the United States Government lands increased sharply? What would that do to the incentives to recycle? Anything?

Mr. **Stone**. Well, I think that the incentive to recycle is there now. Incentive to recycle is coming from our customers—the newspapers, if you will—and we are moving in a direction to recycle; as Mr. Cavaney said, to get a hold of every old newspaper we can.

So I am not sure that if the price of timber were to escalate dramatically, if that would make a major difference based on the way we are moving today.

Senator **Wirth**. The cost of what goes into your timber product being in part what the virgin timber costs, that does not make any difference at that point? That would not make any difference?

Mr. **Stone**. It could cost more, and I suppose the price of paper would go up, but the fact is, if we are going to achieve the goal that we believe we will, in a very short period of time we are going to be recycling all the old newspapers we can.

Senator **Wirth**. What percentage of old newspapers are recycled now?

Mr. **Stone**. About 35 percent.

Senator **Wirth**. Are those all used in the United States? Is that 35 percent used here?

Mr. **Stone**. No. About 20 percent of that is sent overseas.

Senator **Wirth**. So what does the 20 percent that goes overseas do? What happens to that?

Mr. **Stone**. It is used in newsprint mills overseas, presumably.

Senator **Wirth**. Why is that not used in newsprint mills here? Because there is a demand for it there and there is not a demand for it here?

Mr. **Stone**. The newsprint mill capacity here has lagged a little bit. We talked about how much time it takes to reequip the mills, to get permits, et cetera, and that is coming on stream.

Senator WIRTH. And we have available a lot of virgin timber, and they do not. Is that right?

Mr. STONE. That is absolutely true.

Senator WIRTH. Ms. Dollar talked about the Japanese, but if the price of timber went up here, you are saying it would not have much of an impact?

Mr. STONE. On the incentive to recycle newsprint? I think the incentive to recycle newsprint is there now, and we are going to do it. We are doing it.

Senator WIRTH. Let me see if I understand this. The Japanese use a lot of old newspaper. Twenty percent of our newspapers are exported. The Japanese use a great number of them because they do not have available a lot of virgin timber. There is a greater incentive there to use recycled paper than there was here. Is that right?

Mr. STONE. Well, the Japanese are using—let me put it this way. As I say, it takes time to reequip these mills to make recycled newsprint. We are doing that. I believe when those mills come on stream we probably will greatly reduce our exports of old newsprint. We will be using it here.

Senator WIRTH. Just to understand the economics of it, presumably the Japanese have a choice of going to Malaysia and buying timber or buying old newsprint from the United States, is that right?

Mr. STONE. Yes.

Senator WIRTH. And it is a lower cost to buy newsprint here than to buy timber there, is that right? I mean, if it were cheaper to go to Malaysia, they would go to Malaysia.

Mr. STONE. My colleague is telling me that we do not ship our old newsprint to Japan.

Senator WIRTH. Where do we ship it?

Mr. STONE. I guess to Europe, primarily.

Senator WIRTH. There is no U.S. newspaper that goes to Japan?

Mr. CAVANEY. A point we tried to make, Senator, in the testimony is that old newsprint goes into many more products other than just new newsprint, and that is a very attractive product in a lot of the developing and other countries that are fiber shy, so it goes over to them as a source there.

They also have the same technological problems that we have here in the United States. You must also have virgin fiber to mix in with the recycled fiber, no matter what country you are in.

Senator WIRTH. I understand that. I was just curious about the point that if the price of timber went up in the United States, that would just raise the price of paper and would not have an incentive for more recycling.

It seems to me that if foreign countries are using a lot of old newspaper because they do not have available timber, or virgin timber at a reasonable price, that having a very high price for virgin timber increases their incentive to recycle. It seems to me that is perfectly logical. That works apparently overseas, but it would not work here.

Mr. STONE. If the price of timber went up dramatically in the United States, you would have a lot more imported paper.

Mr. Brumback. You would have a lot of other problems, other than the recycling of newsprint, with the house building and other industries. The construction industry, other uses for lumber, would be impacted. The bulk of the recycling is done in the United States, and therefore an awful lot of capacity exists today, and there is a lot more capacity that is under construction right now for recycled newsprint that will be coming on line here in the next few years.

Senator Wirth. I am just curious about the economic incentives of this.

We just finished a major piece of legislation related to the timbering on the Tongass in southeast Alaska in which almost 95 percent of the product coming off of our national forest went to Japan. It was virgin timber going to Japan, paid for in large part by the U.S. taxpayer—enormous subsidies to the Japan paper industry coming from U.S. taxpayers.

It seems to me the economics of this have a lot to do—I was just curious about Mr. Stone's statement that if the cost of timber went up, it would not have any impact on the incentives for recycling. I find that a little hard to believe, but obviously I do not understand the economics of making newspaper.

Let me go back to the question I was trying—maybe Ms. Dollar can do this. Do you save a lot of energy—this is the Energy Committee. Is there a significant energy saving?

Ms. Dollar. Yes, there is. I believe it is 60 percent in the energy area, and just about as much in water usage.

Senator Wirth. Do you have any numbers on that? Is that true, Mr. Stone, Mr. Brumback?

Mr. Brumback. There is a significant savings. However, most of the virgin production is done near hydroelectric sources. Most of the recycling that is being done today is done close to the municipalities where energy costs are high, and they would never think of making paper from virgin pulp near a big city. It would just be uneconomic.

So the economics are such, yes it does take less power to make recycled paper, but the tradeoff is—your cost per unit of electricity is much higher, but you use less electricity to make it and it is near the metropolitan areas.

Senator Wirth. Is there any way of measuring that?

Mr. Brumback. Oh, yes. I am sure that we could get those statistics on the kilowatt hours.

Senator Wirth. I was just thinking, for Mr. Glassman, it is fun to figure out how many Exxon Valdez spills is the difference between—you know, X newspaper using virgin stock and X newspaper using recycled paper. You could have a lot of fun with that.

Mr. Glassman. Shall I calculate that now? I think there is definitely something to that.

Senator, if I could, you were talking about the economics of this, and one of the things that has struck me as curious as a purchaser, even indirectly, of recycled newsprint is, I guess in a way you would sort of expect that recycled newsprint would cost less than newsprint produced by chopping down virgin trees, and that in fact does not seem to be the case.

I think that is a sign of a lack of capacity. And I am not really sure why there is such a lack of capacity.

Mr. STONE. You know, 1 or 2 years ago it was very tough to sell recycled newsprint. Nobody really wanted it. We have had a paper mill in Arizona, which is as I said, is a major supplier—that newsprint comes from Colorado—since 1972 producing recycled newsprint. It is only recently that we had no problem at all selling the output of that mill. So now that the public is aware and environmentally conscious, recycled newsprint is much in demand and our industry is building recycled content.

But as I said, again, it takes several years to put that on stream. And that is why today there is not as much recycled capacity as there is demand. It will be there within the next few years.

Senator WIRTH. And your guess is—Mr. Brumback talked about the 28 percent goal, is that the goal?

Mr. BRUMBACK. Senator, at the time we set that goal that was all of the capacity that was available that we knew about. And what we were saying as an industry you do not let the Stone Container, recycled paper, go unsold. Dick Scudder, who had the Scudder recycling mills out in the West Coast, had 14,000, 15,000 tons a year capacity that he was not using. We were saying when we set that goal as an industry we must use every bit of recycled newsprint that is made. And we have done that.

I have got to say that after that policy statement was made, the Washington Post, who buys paper from our mill in Quebec, which is virgin paper, came to us and made a very strong case that they wanted some of our paper from Ontario, which is recycled. And we arranged to give it to them.

So by setting that goal, the publishers have gone to work and taken all the capacity and they are committing to take additional capacity that is now under construction and that will be completed in the years ahead.

If I could back up just a minute to this—the Federal goal setting in the newsprint business. We think we have done a credible job as a newspaper publisher of telling the publishers you have got to get with recycling. We think the publishers have responded and responded well. I am not aware of any publisher that is not out looking for all of the recycled newsprint he can get his hands on.

To set a Federal goal of what the content of newspapers in the United States—major source of product, in other words, newsprint is 25 percent to 30 percent of our product comes from newsprint—to permit the Federal Government to set standards over that part of our product smacks of what is going on in some Third World countries where the government is controlling the importing of newsprint and saying who gets newsprint or who does not get newsprint.

Senator WIRTH. Is there any requirement in this that says what any newspaper ought to do, Mr. Brumback?

Is there any requirement is this legislation—I mean, you have raised the huge First Amendment ghost that is out there. Casper has just come in here, right? We hear it all the time.

Do you know, is there any place in the legislation where there is any reference to a requirement on any newspaper?

Mr. BRUMBACK. You are talking about a major part of the raw material that goes into making a newspaper.

Senator **Wirth**. Is there any requirement in here on any newspaper that could be construed as being a First Amendment abridging in any way, shape, or form?

Mr. **Brumback**. I did not say the First Amendment.

Senator **Wirth**. That is where you are headed.

Mr. **Brumback**. No, I am not.

Senator **Wirth**. The cold hand of Third World censorship, or whatever it might be that was said, was headed——

Mr. **Brumback**. It is the control of a major part of our product, a major raw material that goes into newspapers by standards set by Government.

Senator **Wirth**. I think that is not the case. I think what this legislation says is that mills should increase the amount of newsprint available. They should increase the amount that is recycled and that that goes up. And some newspapers are going to want to buy 90 percent; and some newspapers are going to say, we do not want to buy any. And that is their choice.

This is not Uncle Sam coming in and saying to this publisher, you have to do X, Y, or Z. That would be an improper thing to do. But that is not what is in this legislation.

Mr. **Brumback**. That is not the way we look at it.

Senator **Wirth**. You ought to get your lawyers to go back and look at this because I keep reading this from the newspaper publishers. And we explicitly went around that issue, understanding the sensitivity of the publishers and understanding what you all would probably attempt to say on this sort of thing, that this was a First Amendment issue. We anticipated that one coming down the line.

Now, if we have not done that appropriately, let me know.

Mr. **Brumback**. I am reminded here that the way we are impacted by this is that over 50 percent, almost 60 percent, of the newsprint that is used by American publishers comes from Canada. You are setting standards or goals for recycled content of newspapers or of newsprint. And by putting a requirement on the mills in Canada that are supplying 57 percent of the newsprint to American publishing, you are indirectly controlling the newsprint that comes into this country.

Senator **Wirth**. Run that one again?

Now what do we have, a problem with the Canada-U.S. Free Trade Agreement?

Mr. **Brumback**. I did not mention the Free Trade Agreement, you did.

Senator **Wirth**. I just wonder where this is going.

Mr. **Brumback**. Like I did not bring up the First Amendment, you did.

The Canadian newsprint producers produce 57 percent of the newsprint of American publishers, United States publishers.

Now your bill sets standards for that newsprint, indirectly sets standards for that newsprint that the American publishers use. You get around that by setting up this commodities exchange of recycled credits that are going to be traded, bought, and sold by those mills, that for one reason or another, do not want to get into recycled newsprint. So we are going to create a new exchange here somewhere, I guess it would be in the United States, that would buy and sell those rights. But to do business in the United States, they are either going to have to meet the criteria or buy the credits from somewhere else.

Senator WIRTH. Therefore, what impact does that have on——

Mr. BRUMBACK. You are messing up a market that is now doing well and has tremendous investment in recycled capacity. There is a trend in place that is going perfectly well without Federal goals or recycling credits.

Senator WIRTH. That is thoroughly debatable. But what does this have to do with the freedom of publishers?

Mr. BRUMBACK. I did not mention freedom of publishing. I am talking about restrictions on a major raw material that goes into newspapers in the United States.

Senator WIRTH. What does that have to do with the threat that this is similar to Third World countries' threats to the press?

Mr. BRUMBACK. That is where Government's control—You know what I am talking about. It has to do with the Government setting standards and control over the newsprint that the publishers have access to.

Senator WIRTH. Now if the Government sets standards, say OSHA standards, at a paper mill, does that have the same impact?

Mr. BRUMBACK. No.

Senator WIRTH. What is the difference?

Mr. BRUMBACK. They are the same for all mills, all businesses, I would assume.

Senator WIRTH. No, they are not. There are standards, OSHA standards, for paper mills that are very different from OSHA standards for filling stations.

Now would that be a similar kind of position? What is the difference?

Mr. BRUMBACK. If it got to the point where it stopped the production of newsprint or made it so costly that it was uneconomic for newspapers to buy it, it would be of concern. But that is not a concern.

Senator WIRTH. How about EPA standards, clean air standards? Is that an imposition as well on newspapers? That is a standard that gets set on paper mills that does not get set on anybody else. It does not get set on anybody else because paper mills have certain kinds of problems, so EPA has a certain set of standards related to paper mills.

Mr. BRUMBACK. That is not unique to newsprint mills. That is all kinds of people that convert fiber.

Senator WIRTH. Let me ask a final question, if I might. There was a question that you raised, Ms. Dollar, about using newspapers as an energy source and that that was an inefficient thing to do.

And similarly that argument was made by the tire people this morning, that we should not use tires as an energy source because that was an inefficient use of the resource. But currently, a vast amount of that resource is not being used at all; there are mounds of tires in California that are not being used for anything. There are mounds of tires in every landfill in the country that are not being used for anything useful.

Now, in the ideal world, you would want to use those tires, maybe for some higher use. But there is not a higher use. So we would suggest why not use them in part now for energy.

A similar kind of a situation in newspapers. You argue you should not use newspapers for energy because there is a higher and better use. But a lot of those newspapers are going into landfills now and not being used for anything. Now that is kind of a dilemma, right?

Ms. DOLLAR. It is a catch-22.

Senator WIRTH. So there must be a continuum. You must get to a certain point where you stop using newspapers for energy after there is a higher market created for them all.

When does the point come when it is better off? We are in a situation now where a lot of newspapers are going into landfills and not being used for anything. They are being collected and going into landfills.

Ms. DOLLAR. Well, some newspaper does get into landfills. I would have to say that newspapers, magazines, telephone books, because of their high visibility, tend to be the first things people take shots at. Actually, only 7 percent of landfills is a newsprint product. Most of it is high-grade papers and mixed paper. So newsprint is not the culprit in the landfills to begin with. They have a pretty high recycling rate as it is.

The problem, however, is in the use of energy in order to burn. There is really not that much of a net gain in burning it. Plus, in the burning process, unless a process can be developed for burning that is not inherently polluting—and we have not gained anything because what happens is if you are burning a product with ink on it—and there is heavy metal in the pigment in that ink that is on the paper—then you are going to be releasing that into the atmosphere. That is not necessarily the best answer. Temporarily, maybe. But in the long run, no. It is not the best use.

Plus, you are using it once for possibly very little energy savings or gain. If that fiber can be continually put back into the recycling system, then it can be reused over and over again. To burn it, you use it once and it is gone. It is gone; it is not in the landfill. But it is not really the culprit in the landfill to begin with. So I do not know if we are directing our efforts in burning the right product. Burn the mixed waste, the stuff that is really out there in large portion in the landfill.

Plus, the newspaper industry has announced a tremendous amount of new capacity to meet the demand of paper that is presently not achieving its best and highest use. So I think, in that respect, the newspaper industry has been doing a very fine and credible job of meeting the demands that consumers do have. Right now they are flat sold out. They do not have anything. And you can only put as much product in those machines and make paper as you can get in.

Unfortunately, we do import a lot of paper from Canada. So even though we might be able to reuse and resell everything that we make in this country, the demand for newspaper is very high. And we are importing newspaper. We cannot accept all of that into the present capacity that this country has. But I would venture to say within 2 years that will definitely turn.

Senator **Wirth**. And that is the point that Mr. Stone makes, that there is a lot on line. Is that right, Mr. Stone?

Mr. **Stone**. That is correct.

Senator **Wirth**. But where everything is sold out, in 2 years or 3 years that will change?

Mr. **Stone**. We think in 2 years or 3 years our problem is going to be having enough supply of old newsprint, frankly.

Senator **Wirth**. Supply of old newsprint?

Mr. **Stone**. We are going to be at the maximum collectible supply of old newsprint and that is going to be a problem. We are going to need as much as we can get.

Senator **Wirth**. And so, therefore, recycling efforts in the cities now or collection efforts, the Thursday morning effort—we are going to have sort of a hiatus or an awkward time for 2 years or 3 years until all of these plants come on. Is that what you are saying?

Mr. **Stone**. I am saying it is going to be a couple of years where we are going to probably have somewhat of a problem, but it will be declining as new capacity does come on stream.

Mr. **Brumback**. It will start coming on stream next year. There are projects—and I think an exhibit to some of this testimony has the timetable of when these projects come on stream.

Senator **Wirth**. Do you change presses during this time, too? Some papers are better than other papers in presses, or that is not——

Mr. **Brumback**. Presses? No. If I could take just a quick second here, the Chicago Tribune—we built its plant in 1982—started up with a whole new offset printing process. To do that we had to rebuild our newsprint mill in Thorold, Ontario. That was a 70-year-old mill and needed to either be shut down or rebuilt or moved. We concluded that to serve Chicago it was best for it to remain in Ontario. It was economic for it to use old newspapers. They used a new process called the flotation process rather than the wash process that I suspect Mr. Glassman's paper uses. It gives you a brighter, whiter sheet. And it introduces the virgin into it. And we can use up to 100 percent recycled fiber in making that paper. Right now we are at 55 percent to 60 percent that is recycled fiber. The press that is common today can take that recycled sheet.

Senator **Wirth**. So presses are really not an issue in this?

Mr. **Brumback**. The newspaper investment side is not an issue. The issue is the newsprint producers' side where they have to invest in recycling.

Senator **Wirth**. And Mr. Stone says that is going on now.

Mr. **Brumback**. $1.5 billion.

Senator **Wirth**. Do you think that will then meet all of the demand that is out there?

Mr. **Stone**. Yes, I do.

Mr. **Brumback**. I think one other thing here, the trend that is happening now—and right now we are at the trough of the newsprint cycle—the prices are down at the bottom. It is hard to get them up. And there is more capacity than there is demand.

The time will come, I am convinced, when recycled newsprint will sell at a premium over virgin newsprint. Right now it is close to that.

Senator **Wirth**. Why?

Mr. **Brumback**. Because publishers want it right now. They can get by with it because there is not enough capacity out there. But we would hope that the time will come when recycled paper will be more in demand than the virgin paper.

Senator **Wirth**. What is going to be the solution, Mr. Stone, to the other problem Ms. Dollar brings up—only 8 percent of the landfill, to use the number, are newspapers. That is the easy part of the waste stream to take care of and the one everybody focuses on. You are saying 30 percent to 40 percent are other paper products, packaging, and so on. What do you see happening over the next decade in that area?

Mr. **Stone**. In the mixed waste area—I think she was referring to the tissues and some packaging—I think that in that area, waste-to-energy is certainly something that has to be considered. The technology is developing on that. But some of it can go to waste-to-energy sources and that is, I have to say, a homegrown resource and not an imported one. I cannot say that I am an expert on that, however.

We will never get all of it. Some of it is going to have to go to landfills.

Senator **Wirth**. I understand. Those costs are going up dramatically so there is going to be some market out there if you can reduce the cost of the landfill. That is going to be market. And if this so-called mixed waste is a major part of what goes into a landfill, then what you all would argue is do not worry about the newspapers, that is being taken care of, says Mr. Stone and Mr. Brumback.

I am now thinking about okay, what will we do? If that is only 8 percent, what happens to the other 30 percent? What does the industry know about moving that 30 percent of mixed waste into the energy area or into some other uses? You are suggesting that that is a much bigger target of opportunity.

Ms. **Dollar**. Yes. Our feeling is that the high-grade papers occupy, and they do indeed, occupy a larger percentage of the landfill. And these are areas that can be source separated and diverted from the waste stream to eliminate that particular problem. And you are always going to have a certain amount of what we call the mixed waste.

As our testimony states, those are the categories that could be used for waste to energy because they really do not have another life as anything else. But there are grades of paper in there that do have many opportunities to serve a useful life, in particular high-grade papers, printing and writing grades, which are occupying a larger percentage of the landfill. That is where I would probably target my efforts.

Senator **Wirth**. And that could be source separated? What do you mean by that?

Ms. **Dollar**. It is diverted from the waste stream through printing plants, office waste—that is what you are seeing, all the office waste collection procedures around. I do not know if your office has the three little waste baskets. But that is what a lot of that is all about. And, generally, as a market grows and demand increases, as we know the free enterprise system, if somebody feels they can make a buck off of something, they are going to figure out what to do with that paper.

Right now we are in the recycling phase where we have the cart before the horse a little bit, where our collection procedures are kind of jumping ahead of the capabilities of manufacturing to deal with all of this. And there are some mills who will never be able to accept waste paper into their product mix, either because of the technology of their equipment or the type of product that they produce.

So these are the things we need to deal with, and again learning more about the technologies, we are talking more about recycling and at the ground level learning more about source separation.

Senator WIRTH. You say there are two issues: (1) the source separation issue, and (2) the other mixed waste. How do you collect that?

Ms. DOLLAR. We sure do not recycle tissue paper at my house. I am not planning on starting one, either. So that is something that has served its useful purpose. There are grades of paper that we just do not source separate, but there still is fiber in there that could be used.

Senator WIRTH. I am thinking more about enormous amounts of other packaging that is part of this mixed waste issue. This is very interesting.

Let me ask you a final question. I met with the head of the Government Printing Office and there are certain requirements that Senator Ford was talking about of the Government Printing Officers in terms of recycled requirements. I have forgotten. Do you remember what they are? They had a 25 percent procurement guideline.

I do not think it is speaking out of school. I said to him, is this adequate? He said well, it depends on how you define what the recycled product is going into this. He said, there is a lot of sawdust content in this.

Ms. DOLLAR. Cotton fiber content, which is traditionally used in rag papers, does count as a recycled material under the present EPA guideline. It is not what we call a landfill issue, nor is sawdust a landfill issue. So what we are after is to reclaim the paper fibers for use. Again, not the cotton fibers, not the sawdust.

Senator WIRTH. He said he thought that that requirement could be significantly higher.

Ms. DOLLAR. Oh, yes. I think with development in the industry and cooperation between manufacturing and the Federal Government, that with time—nothing happens overnight. We do not just turn the lights on, and industry does need time to work into this, but a higher rate is realistic.

Senator WIRTH. So it is the definition of what you are calling recycled that is very important. We keep coming back to that. Recycled is a very loosely used term, is that right?

Mr. STONE. It is.

Senator WIRTH. He was saying that percentage could be a lot higher than it currently is.

Ms. DOLLAR. Well, public perception of the word recycle is post-consumer. In other words, something that has fulfilled its end use, its life cycle, and is diverted from the waste stream for reuse as another product or as the same product. For example, newsprint and glass and aluminum are generally what we would call a primary recycling. In other words, newsprint to newsprint, glass to glass, and cans to cans.

Senator WIRTH. Sawdust is not a post consumer use?

Ms. DOLLAR. Not in my opinion. I do not know that sawdust is a national landfill problem.

Senator WIRTH. Just as a requirement. I am talking about my conversation with him about how much should be there. He said 25 percent he thought was too low. We could have a requirement of the Government pulling the demand for recycled paper significantly. Is that something we ought to do, do you think?

Ms. DOLLAR. Yes.

Senator WIRTH. Should the U.S. Government, again going back to our role, Mr. Brumback, should we have a much higher requirement on recycled paper?

Ms. DOLLAR. That would not keep industry from making any product they want to sell on the open market. Selling to the Government is not the only place that we all sell.

Senator WIRTH. But there is a great big market there.

Ms. DOLLAR. Oh, it is great for keeping machines running at low margin. I mean, I would have to admit nobody is getting rich off selling to the Government.

I sold to the Government Printing Office for years, and there were times I lost my shorts selling to the Government Printing Office, but it is a good way to keep equipment running, particularly during times of slow market, and that does happen. Generally, every 24 months we experience a slowdown in market as capacity exceeds demand, and then demand creeps up to meet that capacity.

Senator WIRTH. Do you have any comments on that, Mr. Stone, on the percentage of recycling, that the 25 percent ought to be higher?

Mr. STONE. One of the things I do not know how you come up with a reasonable figure. Some of us are dependent on supply. Cost, obviously, is a consideration, and I think that probably this question about sawdust or reclaimed fibers as opposed to, maybe, post consumer fibers that we talk about is something that ought to be defined. It ought to be determined.

Reclaimed material is something that if it is not reused in paper, it has got to go somewhere, and I guess that is a question of definition and what the EPA wants to give preference or emphasis on.

Senator WIRTH. Well, I thank you all very much. This has been very useful and very interesting. And I think, Mr. Stone and Mr. Brumback, you make a very good case on what the industry is doing and where it is going. I think it is very useful.

Ms. Dollar, I thank you very much. It is very helpful from a technical and recycling point of view.

Mr. Glassman, we thank you very much for being with us.

To all of you, thank you, and if there are further questions we will be sending them off to you.

Thanks ever so much.

[Whereupon, at 4:25 p.m., the hearing was adjourned.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

The Washington Post
1150 15TH STREET, N. W.
WASHINGTON, D. C. 20071
(202) 334-6000

BOISFEUILLET JONES JR
VICE PRESIDENT AND COUNSEL
(202) 334-7141

BY HAND

July 26, 1990

The Honorable Timothy E. Wirth
United States Senate
380 Senate Russell Office Building
Washington, D.C.

Dear Tim:

In view of publicity about The Post's use of recycled newsprint and your role on environmental issues, I thought you should know what the newspaper has actually been doing.

The Post got a black eye last autumn from an NBC evening news segment that erroneously said The Post was not using any recycled newsprint, and more recently from Duncan Spencer's two Roll Call columns that wrongly said The Post really couldn't care less. The Post uses all the newsprint with recycled content it can get from its two suppliers (Stora and Quebec & Ontario) which make some recycled newsprint. That amount represents only 5% of The Post's total newsprint consumption today, and about 5-10% at the time of the NBC report. The percentage will grow to over 20% this autumn when Abitibi-Price begins using recycled pulp at its Augusta, Georgia mill; to over 35% in late 1991 when Bowater begins using recycled pulp at its Calhoun, Tennessee mill; and to 50% in late 1992 when Daishowa completes a recycling retrofit at its Quebec newsprint mill.

All the newsprint used by The Post is provided by six suppliers pursuant to long-term contracts. The Post (as well as many other newspapers) has told its suppliers that they must start making recycled newsprint if they hope to continue business as usual after their contracts expire. The response has been encouraging, as illustrated by these new Bowater, Abitibi-Price, and Daishowa projects. The Post's other suppliers are at the planning stage.

The Post has also taken a major step to help municipalities in the Washington, D.C. area--as they develop curbside programs to diminish the solid waste flow--cope with the short-term glut in the market for old newspapers. On July 2nd the District government signed a five-year contract with Capitol Fiber, Inc., a Maryland company 90% owned by The Post, to process and sell for recycling purposes all the old newspapers collected by the City. Capitol Fiber is making similar offers to other local jurisdictions which, unlike Montgomery and Fairfax counties, do not have an established relationship with a purchaser of old newspapers such as Southeast Paper Company.

While much attention has been brought to this issue lately, The Post's interest is not new. It was one of the original supporters of the Garden State experiment in 1960 and bought newsprint annually from that mill until 1988, when a change was made for quality reasons. For decades The Post has collected and sold to recyclers its press waste and unsold newspapers (about 20,000 tons a year). The Post has also participated in experiments with newsprint made in part with recycled pulp.

If you or your staff is interested in more details about The Post's practices, please do not hesitate to get in touch.

Sincerely,

Bo

Boisfeuillet Jones, Jr.

COMMENTS OF THE PAPER RECYCLING COALITION

ON S. 2923

FOR THE
SUBCOMMITTEE ON ENERGY REGULATION AND CONSERVATION
COMMITTEE ON ENERGY AND NATURAL RESOURCES
U. S. SENATE
WASHINGTON, D.C.

AUGUST 2, 1990

The Paper Recycling Coalition (PRC) represents 11 manufacturers of recycled paper products. Member companies are: Caraustar Industries, Field Container Corporation, Garden State Paper Company, Halltown Paperboard Company, The Newark Group, Newman & Company, Rock-Tenn Company, Sonoco Products Company, Southeast Paper Manufacturing Company, Waldorf Corporation, and White Pigeon Paper Company. The member companies also are active members in good standing of the American Paper Institute.

These companies produce well over three million tons of paper and paperboard products containing 100% recovered materials. Two of these companies, Southeast Paper and Garden State Paper are leaders in the production of newsprint from 100% used newspapers.

It is the objective of the paper recycling industry to maximize paper recycling to the fullest extent economically and technologically feasible. In 1989, 27.6 million tons of recovered paper were collected in the U.S. for reuse at home and abroad. During that period virtually every mill was operating at capacity. Based on the planned expansions in domestic recycling capacity and the projected growth in recovered paper exports, we view the recovery of high quality paper and collection to be the long-term challenges in achieving maximum paper recycling rates.

The paper recycling industry is pledged to forging a partnership with federal, state, and local governments to better educate the public, government, businesses and consumers on the importance of using recycled paper products and of supporting programs to recover paper for recycling. We can only recycle paper which can be recovered efficiently and economically in usable form.

There are two key components to encouraging increased recycling of paper products.

- The first is to assure that usable recovered materials can be obtained for recycling at a competitive price in the marketplace.

This means that collecting and sorting must be performed correctly and economically -- recyclers must be able to obtain the highest quality raw materials at the most competitive price. It also means holding down the cost of transporting recovered materials to the recycling mills. For many mills, transportation is the largest single cost in the recycling process. Proximity of the mill to sources of recoverable paper has become a significant factor in the siting of new facilities and the expansion of existing plants.

- Second, the government and the private sector must work together to help create and increase demand in the marketplace for products made with recovered materials. Increased demand will encourage the recovery of increased volumes of fiber, diverting this material from the municipal waste stream.

Several features of S. 2923 will tend to discourage increased recycling of newsprint either by making recovered newspapers too expensive or by overregulating the manufacturing of recycled newsprint.

The principal reason that the PRC cannot support this legislation is the provision that encourages the burning of used newspapers which is one of the industry's most valuable industrial raw materials. In addition the bill would create an arena for the commodity trading of 'credits' which would fail to produce any significant increase in the amount of fiber recovered or manufactured into recycled paper products.

By providing credits for energy production, the legislation provides an incentive to burn instead of recycle recoverable fiber. The rationale behind this provision is inconceivable to the PRC. The paper recycling industry has spent hundreds of millions of dollars on research and development and the construction of new plants designed to increase the use of newspapers in the manufacture of new paper products.

It is totally contradictory to this effort to subsidize the burning of used newspapers which are a valuable and critical raw material source. Such an incentive would be particularly damaging to the manufacture of recycled newsprint. It will discourage the source separation and collection of old newspapers which in turn will distort the market demand and increase the price of this raw material. The result will be that fewer newspapers will be recycled.

Moreover, this bill would place the Environmental Protection Agency in the role of controlling the overall or individual manufacturing processes. The bill would direct EPA to mandate the use of certain types, grades, and volumes of recovered fiber. This does not provide for the flexibility necessary in the manufacturing process to meet the demands and specifications of the customer. We believe that recovered materials should be recycled as the first priority and that no incentives should be established to bypass the access to the raw materials which are critical to the newsprint recycling industry.

The bill also would encourage the development of deinking processes. Yet it is unusual for customer requirements to demand products which require deinking of the raw materials. Millions of tons of post-consumer paper are recycled each year without deinking and are used in paperboard, construction materials, etc. (Remember: "Grey is Beautiful.")

Finally, the PRC is concerned that every level of government from local municipalities to the federal government is attempting to write its own definitions of key operative terms for our industry such as "waste," "recovered materials," and "recycling." Numerous congressional committees and nearly every state legislature has considered or approved recycling legislation. Each legislative proposal seems to create new definitions and requirements that conflict with existing law or industry standards and which create institutional barriers to the increased recovery of fiber and to recycling.

With each new round of legislation it becomes even more difficult for paper recycling mills to meet changing and conflicting product specifications when they are attempting to manufacture and market materials and products throughout multi-state areas. Conflicting definitions and product requirements inhibit new manufacturers from entering the marketplace. Recently, the PRC has had an opportunity to work closely with the Committee on Commerce, Science and Transportation in the development of definitions and terms which are universally recognized in the recycled paper industry. We have attached a copy of those definitions and terms to our testimony and would urge you to review them and incorporate them where appropriate in this legislation.

The Paper Recycling Coalition does support the continued role of the DOC to provide information on current and projected domestic and foreign marketplace demands for recovered materials and recycled products. We would encourage the Committee to address the federal procurement of recycled products. Rather than focusing on levels of recycling, or procurement of products with minimum levels of recovered material content, we would suggest the following approach:

> A purchase of 100 tons of various grades of paper such as paper towels, packaging and tissue may consist of varying ranges of recovered fiber content. The purchases may include:
>
> 10 tons @ 100% recovered fiber content = 10%
> 10 tons @ 50% recovered fiber content = 5%
> 20 tons @ 70% recovered fiber content = 14%
> 60 tons @ 35% recovered fiber content = 21%
> Overall recovered fiber content = 50%
>
> However, the goal could also be met by the following purchase:
>
> 50 tons @ 100% recovered fiber content = 50% Overall recovered fiber content.

We believe that public education and planning will form the backbone of market demand. In contrast, the 'credit' provided in the proposed legislation does not provide any significant financial incentive to build or to expand current operations. Rather the credit system creates a burdensome paperwork requirement on the industry which could cause enormous marketplace disruptions which would seriously harm the industry which the bill seeks to assist--the manufacturers of recycled newsprint.

This burden will become an obstacle or barrier to those not currently using recovered materials. While we would support provision for the eligibility of recycling facilities to apply for existing economic supports such as industrial development bonds (IDB's), we do not support creation of new tax or financial incentives.

PRC members are proud of their recycling record. We are committed to maximizing paper recycling to the fullest extent possible. We look forward to working with the Subcommittee and other committees in Congress in the development of sound public policies that will help us achieve mutual objectives.

WRITTEN TESTIMONY OF THE
AMERICAN PETROLEUM INSTITUTE (API)
S. 2923 (ENERGY PRODUCTION AND CONSERVATION ACT OF 1990)
AUGUST 2, 1990

INTRODUCTION

The American Petroleum Institute (API) is a trade association representing over 250 companies engaged in the exploration, production, refining, transportation, and marketing of crude oil and petroleum products. We appreciate the opportunity to present the petroleum industry's views on the Energy Production and Conservation Act of 1990 (S. 2923). API's comments focus on the bill's used oil recycling provisions.

USED OIL RECYCLING PROGRAMS

Our members are committed to resource conservation and environmental protection. Used oil recycling provides an excellent opportunity to conserve resources and protect the environment, since used oil can be reclaimed for its energy value or reprocessed to make a lubricant.

If an incentives program is needed to encourage used oil recycling, it must be comprehensive. It must address the environmental aspects of used oil management as well as provide incentives for recycling. A successful recycling program must include:

1) A prohibition on listing or identifying used oil as a hazardous waste

2) Broad participation of all potential used oil recyclers -- including petroleum refineries -- by maintaining flexibility and treating all participants equitably.

API does not support S. 2923, to the extent it fails to address whether used oil is a hazardous waste. However, we endorse the bill's flexible approach that would allow broad participation of all parties who can beneficially and safely recycle used oil.

S. 2923 ISSUES

Hazardous Waste Classification

The possibility of classifying used oil as a hazardous waste is a major impediment to instituting used oil collection and recycling programs. As discussed below, a recycling program's viability could be seriously eroded by EPA or a state designating used oil as a hazardous waste.

EPA Concerns

The Environmental Protection Agency (EPA) has long recognized that classifying used oil as hazardous waste would be detrimental to recycling. Such a designation could, in fact, lead to net environmental harm. In its November 1986 decision not to classify used oil as a hazardous waste, EPA stated:

> [w]e have determined that listing [used oil being] recycled would discourage recycling of used oil. Our further concern is that the displacement of this used oil from recycling could cause an increased quantity of used oil to be disposed of in uncontrolled ways, causing harm to the environment. This increased disposal could result from decreased use of used oil as fuel by industrial burners and decreased acceptance of do-it-yourselfer oil by service stations (and similar establishments) . . . .

(51 Fed. Reg. 41901 (November 19, 1986)).

Even though the Agency recognizes the likely detrimental impact on recycling of classifying used oil as a hazardous waste, EPA remains under a mandate from the Court of Appeals for the District of Columbia Circuit to determine whether used oil should be classified as a hazardous waste.

State Experience

When used oil is classified as hazardous waste, handling costs go up and the number of collectors and collection facilities goes down. For example, California legislation that became effective in 1987 instituted stricter controls over the disposition of used oil as a hazardous waste. By 1988, the cost to the public for handling used oil increased from $0.10/gallon to $0.40/gallon. The number of used oil haulers dropped from 121 in 1982 to only 81 in 1988. The loss of collection facilities was even more dramatic: California lost half of its used oil collection facilities between 1985 and 1988. (Source: Used Oil Recycling in California (draft), California Waste Management Board, January 1990).

The California Waste Management Board recognizes these trends may be due to the designation of used oil as a hazardous waste. Among the reasons cited by the Board for these trends are the cost of hazardous waste liability insurance to haulers, liability concerns of collectors, and the high cost for recyclers to obtain permits. While the Board noted there have been increases in the amount of used oil collected in California since the new used oil legislation took effect, it stated the increases could be attributed to the law's new reporting requirements and not to actual increases in the amount of used oil collected. (Ibid).

Disincentives Under RCRA

If used oil is classified as hazardous under the Resource Conservation and Recovery Act (RCRA), there would be significant disincentives to recycling it.

- Many service stations, convenience markets, vehicle repair shops, public entities, and other potential collectors could be required to obtain permits to store used oil. Rather than incur higher costs (from recordkeeping, permitting, and insurance) and liabilities of becoming hazardous waste collectors, some will likely refuse to collect used oil, particularly from do-it-yourself (DIY) used oil changers. The result (as EPA recognizes) would result in more used oil improperly disposed.

- Petroleum refineries, which are already heavily permitted, would likely need an additional RCRA permit to reprocess used oil. Permitting a refinery under RCRA would be expensive to industry, strain EPA resources and not increase environmental protection.

  Permitting delays would force producers with recycling obligations under S. 2923 to buy credits from third parties. Since few recyclers have RCRA permits, producers could buy credits from a limited number of sources. Under this scenario, credits might become expensive. This would raise costs to producers while giving little or no environmental benefit over a program where producers recycle used oil themselves.

Flexibility and Equity

EPA estimates about 400 million gallons of used oil are improperly disposed of every year. To recover the most used oil, an incentives program must encourage participation by those who can recycle used oil in environmentally acceptable ways. Flexibility and non-preferential treatment of participants are critical to maximizing used oil recycling.

API supports regulatory strategies that maximize flexibility. We strongly support the bill's approach that allows refineries to recycle used oil as fuel or to make products. Individual refineries are in the best position to decide the best use for used oil, whether as a feed stock or fuel. In both cases, beneficial recycling occurs and should be credited toward a producer or importer's recycling obligation.

We are also encouraged that the bill does not create artificial subsidies for certain types of recycling. All recycling activities should be treated equally, and should receive the same amount of credit for recycling, whether the used oil is re-refined, reprocessed, or burned for energy recovery.

BALANCING RECYCLING WITH ENVIRONMENTAL PROTECTION

An incentives program should increase recycling. A successful program will allow all facilities that can reprocess used oil safely to do so. Petroleum refineries are excellent candidates for used oil recycling because of their inherent flexibility and existing environmental safeguards.

For these reasons, a used oil recycling incentives program should be coupled with an amendment to RCRA to prevent listing or identifying used oil as a hazardous waste. A combined program would have these benefits:

- If hazardous waste liability is removed, more facilities would be likely to become used oil collectors. Given the need for collection facilities in all parts of the country, it makes sense to set up a program that maximizes the number of collectors.
- A recycling program that is not regulated by hazardous waste rules is likely to be less costly than one where used oil is classified as a hazardous waste.

Balancing environmental protection with flexibility and equity is the key to maximizing used oil recycling. A program which allows all facilities that can safely manage used oil to participate in recycling is needed. API believes our members' petroleum refineries are facilities where used oil can be safely and beneficially reprocessed.

If a federal used oil recycling program is necessary, it must be comprehensive: it must remove roadblocks as well as provide incentives for recycling. The approach in S. 2923 may provide incentives, but it does not address possible environmental regulations (designating used oil as a hazardous waste) that would deter recycling. Legislation must address the problem of used oil being identified as a hazardous waste to create a successful national program.

PREPARED STATEMENT OF HON. ESTEBAN E. TORRES, U.S. REPRESENTATIVE FROM CALIFORNIA

Mr. Chairman, Members of the Committee. I am very pleased to be here today to talk about using economic incentives to solve some of our most severe environmental and energy problems. As you well know, Mr. Chairman, I have been pleased to introduce in the House four pieces of legislation, which are the companion, to yours in the Senate.

The legislation that we have proposed would use market forces to increase recycling of used oil, newsprint, and tires. And just last week, we introduced legislation to increase recycling of lead-acid batteries.

The approach outlined in these bills, while radically different from the traditional "command and control" approach that government has normally employed, is being very well received in Congress.

The ideas proposed in this legislation are a major breakthrough in the management of solid and hazardous waste.

The Consumer Products Recovery Act tackles the problem of oil which is not recycled by using market incentives to lower the cost of recycling.

The Consumer Products Recovery Act would require oil manufacturers to share reponsibilty for recycling, by buying recycled oil back from the re-refiners, or buying recycling credits to show a certain percentage had been properly recycled.

The Newsprint Recycling Incentives Act would mandate that all newsprint manufactured and imported into the United States, contain a certain percent recycled content. Rather than introducing the heavy hand of government regulation into our nation's newsrooms this bill would require that newsprint manufacturers who supply newsprint to newspapers comply with the mandate of the law.

If the manufacturer doesn't have the capacity to achieve the mandated percentage of recycled content they will be able to purchase recycling credits from those manufacturers with excess capacity.

The recycling rate of lead acid batteries has varied wildly over the past twenty years. The price of lead has determined the amount of recycling. While this may seen like pure market economics, the current battery recycling system does not include the environmental costs of lead exposure ...even in very small doses lead is highly toxic. **The Battery Recycling Incentives Act** will put a mechanism into place that will guarantee a high rate of recycling, no matter what the price of lead.

The legislation that we have introduced would oblige battery manufacturers to produce batteries with an annually increasing percent of recycled lead. If the manufacturer is not able to achieve the percent content necessary they would be able to trade recycling credits with manufacturers who have used an excess amount of reclaimed lead.

The Tire Recycling Incentives Act has been proposed because of the severity of tire pile problem in the United States.

Every year Americans generate over 250 million scrap tires 85% of which are either landfilled, stockpiled or illegially dumped.

The Tire Recycling Incentives Act would reverse this situation. It would create a system where the manufacturers of the product would "see to it" that an increasing percentage of their product was recycled. The manufacturers could accomplish this goal by either; using 'reclaimed rubber' from used tires directly in the manufacturing process, or by purchasing "recycling credits" from a tire recycler.

These items all have one thing in common, they cost more to recycle than to replace and as a result they are being needlessly and wastefully disposed. By using economic incentives to tackle the pollution problem we can be assured of meeting our responsibilities to protect the environment.

The system that we have proposed allows a minimum amount of government interference with a maximum amount of environmental gain. Something for which we are all striving.

Again, Mr. Chairman, I want to thank you for honoring me by inviting me here today. And, I would like to commend your forsight and leadership (and that of Senator Heinz) in carrying this issue forward in this august body.

PREPARED STATEMENT OF DR. ROY LITTLEFIELD, DIRECTOR OF GOVERNMENT AFFAIRS, AMERICAN RETREADERS' ASSOCIATION

Mr. Chairman and members of the Subcommittee on Energy Regulation and Conservation, I appreciate this opportunity to testify today concerning S. 2923, the Energy Production and Conservation Act of 1990. My name is Roy Littlefield and I serve as Director of Government Affairs for the American Retreaders' Association ("ARA"). ARA is a national nonprofit trade association representing over 1500 small business members who are engaged in the retreading or recycling of used tires, the repair of tires, and the sale of related products and services.

The ARA congratulates Senator Wirth for initiating discussions on this level to address the very serious environmental and economic concerns related to scrap tire disposal. As an increasing number of city, county and state jurisdictions further restrict or significantly increase the fees for disposing used tires, it becomes imperative that industry leaders work with lawmakers on all levels to promote viable, low-cost, meaningful alternatives for discarding used tires. We must work together to develop and promote ways to harness, control, and utilize to the greatest extent practicable the sources found in a used tire.

Retreaders nationwide thank you for including us in these discussions and in this process. We believe that we have an important role to play, not only because we indeed recycle used tires but also because we are key players in scrap tire disposal. To our members a used tire is in essence a raw material to be used in the retreading process. We must actually seek out and collect used tire casings. Following extensive and rigorous inspections, we either retread the used casing or dispose of it.

ARA thus promotes the concept of economic incentives to increase the number of tires being retreaded and attempt to develop with government officials on all levels productive alternate uses for scrap tires no longer retreadable. To those ends, Senator Wirth has made bold advances.

If a tire is retreadable, the industry wants to see it retreaded. In 1989 over 35 million tires were retreaded in the United States by approximately 1900 retread plants. The retread industry used more than 585 million pounds of tread rubber, conserving some 400 million gallons of oil that would have been needed to manufacture those tires that were retreaded. The Environmental Protection Agency speculates that yearly 7 billion pounds of used tires, representing the consumption of 1.75 billion gallons of oil, are non-productively disposed.

In addressing S. 2923, we would like to repeat our desire to work with the Committee in drafting the finest, most realistic and reasonable legislation possible. Topics of concern we would like to raise include:

(1) Because we contend that retreading continues to be the most productive use of a used casing, we would like to see all retreadable casings retreaded. Thus we believe that either additional credits or an increased economic incentive should be offered specifically for retreading;

(2) We believe that either the legislation or the Committee Report should direct EPA to develop performance standards so that retreadable casings can be identified and removed before reclaimed through shredding or crumbling;

(3) The bill as written leaves few options for credits available to new tire manufacturers. The retread industry has traditionally been a small business recycling industry. We are concerned that the legislation could force large tire manufacturers either into the retread industry or increse their current productions of retreads, resulting in the displacement and closing of small businesses;

(4) We are concerned that if landfills are closed off to all scrap tire disposal, that in certain areas of the country where alternatives are currently rare that the problems of properly handling and disposing of casings will be intensified and abuses could occur;

(5) The issue has been raised that the U.S. should ban the importation of used truck tire casings. Currently the industry retreads over 15 million medium and heavy truck tires per year. That figure is higher that the number of new medium and heavy truck tires sold. The major concern that most truck tire retreaders experience is a lack of available casings. A casing that is imported could subsequently be retreaded 2 to 3 times, thus conserving valuable natural resources and indeed working to address the scrap tire disposal problem. If in any way the number of retreadable casings were limited, it would have a devastating effect on the retreading industry.

In conclusion, ARA would like to again praise Senator Wirth for initiating congressional dialogue on scrap tire disposal. We offer our services and industry expertise to work with you to insure a greater use of retread tires and an increased use of non-retreadable casings for productive purposes. Together--government and industry--we have an opportunity to develop meaningful legislation which will set examples in the conservation of valuable resources, recycling, and cost savings.

PREPARED STATEMENT OF DR. T. RANDALL CURLEE, ECONOMIST, ENERGY DIVISION, OAK RIDGE NATIONAL LABORATORY, DEPARTMENT OF ENERGY

Mr. Chairman and members of the committee, thank you for the opportunity to speak on the proposed "Energy Production and Conservation Act of 1990" and the role of economic incentives in addressing waste management.

As an economist I study the way markets work and, in particular, markets in waste management and recycling. This morning I would like to present a simple economic framework to help explain why markets for waste management and recycling do not, in all cases, provide a system that minimizes total costs. I will also discuss general ways to minimize market imperfections and thereby improve the economic efficiency of markets to manage the types of waste included in the proposed legislation.

Much of economic theory is devoted to identifying market structures in which producers and consumers interact in a way such that the allocation of resources is most efficient -- or in other words, products are produced and services are met at least cost. It can be shown that if markets work perfectly, the private sector management of solid waste -- by landfill, incineration, recycling, or source reduction -- will minimize total cost. Under these conceptually-ideal conditions, no type of government intervention could result in a more efficient system.

Unfortunately, the conditions under which this occurs are somewhat restrictive. If certain conditions are not met, our theory suggests that waste management will not be accomplished in the least costly way -- that is, least costly when all types of costs are considered.

Three market imperfections are particularly relevant to waste management -- imperfections with respect to external environmental costs; imperfections resulting from technical, market, and regulatory risks; and the imperfection that in most cases the price paid for disposal does not depend on the quantity or toxicity of waste discarded. Consider briefly the implications of these market imperfections and general approaches to make the system work more efficiently.

An environmental externality exists when the production or use of a product results in environmental damage that is borne by individuals or firms not involved in that product's manufacture or use. When this occurs, the price negotiated for that product will not take into consideration these external environmental costs and, therefore, the product's price will be too low. Environmental damage will subsequently be higher than would exist if this market imperfection were not present.

Historically, command-and-control regulations have been used to place limits on environmental damages that may result from the production or use of a product. However, command and control is not administratively feasible when waste generators are numerous and widely dispersed, as is the case with household wastes. The costs of compliance are excessively high. Economic incentives are, in general, a more effective and efficient means of correcting the price of the product, so that the product's price covers all costs, inclusive of environmental damage.

The second type of market imperfection -- imperfection resulting from excessive risk -- is present to some extent in all markets. Under conceptually-perfect market conditions, all producers and consumers must have perfect information about their markets, or in those cases where perfect information does not exist, all producers and consumers must be able to insure themselves against the risk resulting from the lack of information. There are three general categories of risks -- market, technological, and regulatory. When there is little information, when the information available is of poor quality, and when insurance cannot be purchased, a market imperfection exists. In those cases where the potential social benefits are large, government intervention is, in general, called for to correct the imperfection by promoting research and development, by facilitating the quality and flow of information, and by providing a stable, consistent, and well-defined regulatory environment. And in those cases where market risks are particularly high, government measures to promote market development may also be needed.

The third market imperfection results from the way waste disposal is priced in the United States. The typical household either pays a flat monthly fee for regular pick-up services or has the cost of disposal paid out of local taxes. Neither method provides incentives for households to limit the quantity or toxicity of their waste or consider recycling as an alternative to disposal. Examples can also be given in which the costs paid by manufacturers for waste disposal are not related to toxicity.

Economic theory suggests that one way to solve this imperfection is to force consumers and manufacturers to pay for waste disposal according to the quantity and toxicity of the waste they generate. Unfortunately, this potential solution has the side effect of encouraging households and industries to dump their wastes. In addition, it is generally believed that the cost of administering a system based on both the quantity and toxicity of waste would be prohibitive.

There are, fortunately, other incentive mechanisms that avoid these problems. Credit systems, such as those being considered today, are administratively feasible and circumvent the incentive to dump waste. Such systems also have the benefit of encouraging the proper collection of waste, which can vastly improve the technical and economic viability of recycling.

Arguments can be made that all three market imperfections I have just discussed apply to the waste materials considered in the proposed legislation. External environmental costs are not currently represented in the price of disposing used motor oil and scrap tires in particular, and old newsprint to a lesser extent. A strong argument can be made that the risks faced by firms contemplating recycling of these materials are currently large relative to other investments those firms might make. Further, the vast majority of households in this country do not pay for disposal of these items based on quantity or toxicity.

Given that the potential social gains from improved management of these wastes appear to be large, government has a role to play in reducing these market failures either directly or indirectly. Credit systems are one effective means of countering market failures. Credit systems internalize the costs of recycling such that producers and consumers pay a price more in line with true costs. In other words, the costs of recycling are borne by those who benefit from the product. Credit systems also reduce the risks faced by firms contemplating recycling operations by defining which technological approaches are acceptable and by promoting the development of markets for recycled products.

To summarize, it can be argued that current markets for waste management suffer from market imperfections that cause the total cost of waste management to be higher than it would be in the absence of imperfections. Government measures, such as credit systems, could, however, be put in place to partially correct these imperfections by providing economic incentives to manufacturers and consumers. By correcting or, at minimum, compensating for market imperfections, waste management can be made more environmentally sound, and at the same time less costly.

Thank you Mr. Chairman. I would be pleased to answer questions.

PREPARED STATEMENT OF WILLIAM E. FRANKLIN, FRANKLIN ASSOCIATES, LTD., ON BEHALF OF THE AMERICAN PAPER INSTITUTE

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SUMMARY REPORT

PAPER RECYCLING: THE VIEW TO 1995

INTRODUCTION

This report is an analysis of potential recovery and consumption of U.S. waste paper through 1995. It is the product of a joint effort of Franklin Associates, Ltd. (FAL) and the staff of the American Paper Institute (API), the national trade association of the U.S. pulp, paper and paperboard industry.

The analysis constitutes the first detailed look at how U.S. paper manufacturers are responding to the public policy challenge to expand the use of waste paper as a raw material in their processes. In the preparation of this report, API provided all historical data through 1988 as well as the results of two surveys it has conducted on future industry capacity plans. One is API's December 1989 Paper, Paperboard, Wood Pulp Capacity report, which details committed industry capacity and anticipated fiber consumption through 1992; the other is a Special Waste Paper Survey API recently completed, which extends potential U.S. waste paper demand to the 1992 to 1995 period.

FAL was responsible for all data projections to 1995 and interpretation of the historic data and API survey data.

KEY FINDINGS

- Emphasis on materials recycling as a municipal solid waste management tool has brought with it increasing supplies of waste paper as well as market demand for recycled products.

- Responding to these important changes in waste paper supply and demand, the U.S. paper industry is rapidly increasing recycling capacity, which is leading to unprecedented growth in waste paper demand by domestic mills.

- Over the next three years, domestic waste paper consumption to manufacture new paper and paperboard products will grow at a rate twice that of virgin fiber.

- In 1995, domestic and foreign demand for U.S. waste paper can be expected to be in the range of 40 million tons, a 50 percent increase over 1988 levels.

- Recovering this tonnage translates to a national waste paper collection rate in 1995 approaching 40 percent of all paper and paperboard consumed in that year.
- To achieve this overall recovery, collection rates for the major waste paper grades (other than mixed papers) will need to approach what may be their practical maximum levels by 1995.
- As new recycling capacity is brought on line, the national challenge over the next decade will be to expand the collection of high-quality waste paper from the municipal solid waste stream.
  - More than 88 percent of the additional incremental tonnage that will need to be recovered by 1995 will be post-consumer waste paper.
  - Over 37 percent of all post-consumer paper and paperboard discarded will need to be recovered in order to satisfy the mid-range of projected waste paper demand in 1995. (This would represent a collection rate 45 percent higher than the current national average of 25.6%.)

U.S. WASTE PAPER SUPPLY/DEMAND TO 1995

The available supply of waste paper has traditionally been the product of market demand. However, recently, due to solid waste management strategies that emphasize source separation, recyclables are often collected irrespective of secured markets. While imbalances in supply and demand are not uncommon in virtually any commodity market, this supply-driven approach to recycling has brought with it grade-specific over-supplies (e.g., old newspapers) larger than historic norms.

The data gathered through the API surveys noted above, however, provide solid confirmation of a return to a demand-driven marketplace for the major waste paper grades. In fact, the data not only confirmed the 1985 to 1988 trend of increased waste paper consumption, they actually demonstrate a likely acceleration in that trend to the mid-1990s.

The extent to which these trends may continue through the balance of the decade is uncertain. The principal limitation to ongoing growth in the rate of waste paper consumption after 1995 will be the fact that the country may be approaching the practical limits of recovery for all grades, except mixed papers. FAL and industry analyses indicate that, while rates will vary locally depending on a variety of geographic and demographic factors, maximum national recovery of usable waste paper is likely to be in the range of 40 percent of all paper consumed (built on the following practical maximum recovery rates: 63 to 68 percent of all corrugated consumed; 50 to 55 percent of all newsprint; 50 percent of high grade deinking papers; 100 percent of pulp substitutes; 15 to 25 percent of mixed papers).

The new API capacity and waste paper surveys and this analysis indicate that, in 1995, domestic and foreign demand for U.S. waste paper could range between 39.3 and 42.7 million tons (up from 26.2 million tons in 1988). This demand will require a total recovery of 38.5 to 41.7 percent of new supply (up from 30.6 percent in 1988) (Figures 1 and 2). Within this range, 39.3 million tons was identified by FAL as the 1995 projected demand.

Consumption of more than 39.3 million tons in 1995 could be achieved if domestic manufacturers consume more than 27.9 million tons of waste paper (the API Special Waste Paper Survey indicates an upper bound of 31.4 million tons) or if exports exceed 10.5 million tons (API analysis [Appendix 3] suggests a potential "maximum" of 14.2 million tons). As can be observed in Figures 1 and 2, the projected 1995 supplies of waste paper could fall well short of levels that would be required to meet higher levels of potential demand.

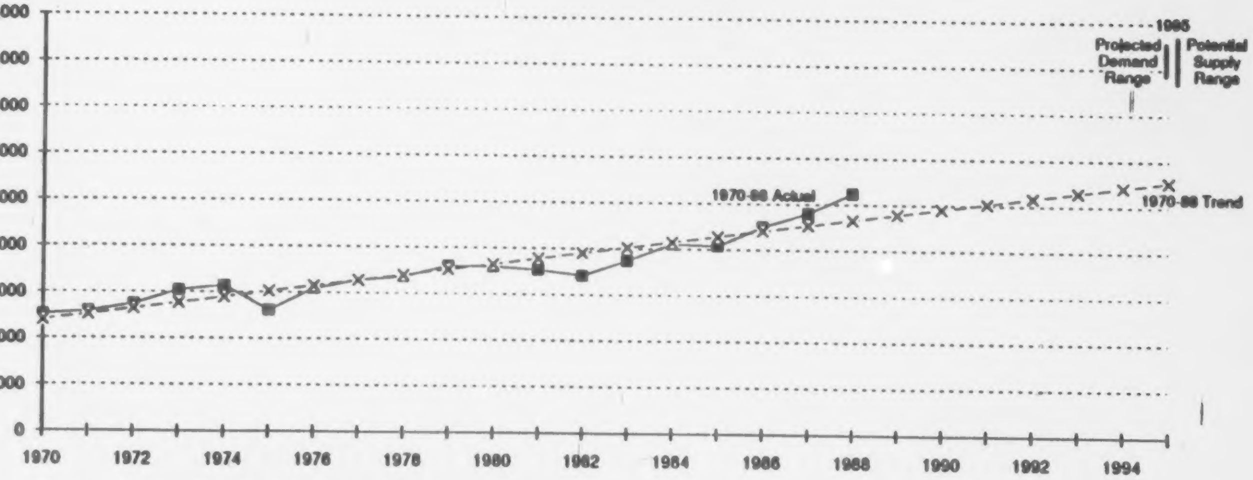
The fundamental changes taking place in the U.S. paper industry's raw material profile are further demonstrated by the following observations:

- New supply of paper and paperboard is projected to grow by nearly 19 percent between 1988 and 1995; demand for waste paper by domestic mills will grow an expected 40 percent during the period.
- The waste paper consumption rate (waste paper input divided by industry production) for domestic manufacturers was essentially flat from 1975 through 1985 at about 24 percent. The rate increased in 1986 and 1988, strong economic growth years during which the industry was utilizing all of its fiber sources at very high rates. API's new survey and this analysis, however, indicate this trend will continue, and, in 1995, the domestic waste paper consumption rate will exceed 30 percent (Figure 3).
- Prior to 1986 the growth in recycled fiber consumption was strictly in proportion to growth in total demand. Exports drove the recovery rate upward. In the period 1988 to 1995, both exports and the domestic paper industry's requirements for recycled fiber will be driving the waste paper recovery rate upward.

The following are more detailed discussions of potential recovery and demand through 1995 of the principal waste paper

Figure 1

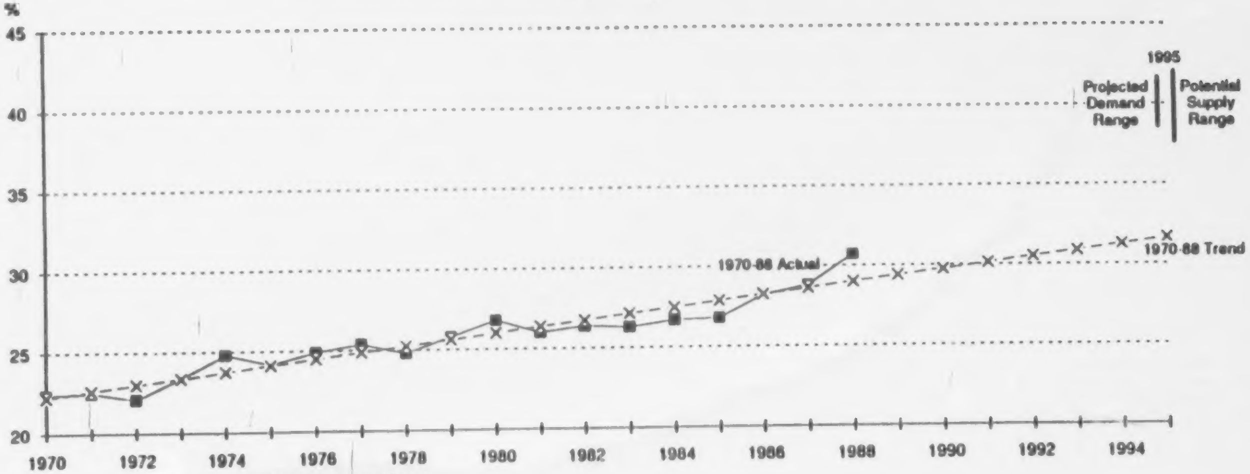
RECOVERY TRENDS FOR ALL GRADES OF WASTE PAPER - 1970 TO 1995
(In thousands of short tons)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand and Supply)

Figure 2

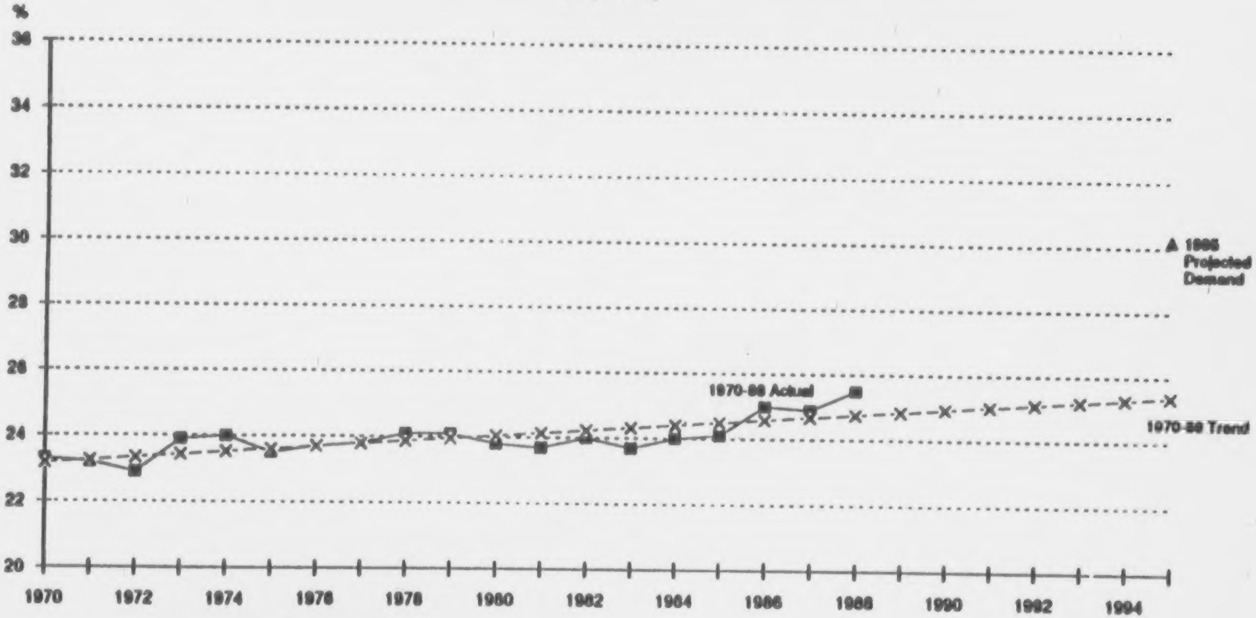
RECOVERY RATE TRENDS FOR ALL GRADES OF WASTE PAPER - 1970 TO 1995
(In percent)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

Figure 3

DOMESTIC CONSUMPTION RATE TRENDS FOR ALL GRADES OF WASTE PAPER - 1970 TO 1995
(in percent)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

grades. A relative comparison of their performance in the 1988 to 1995 time frame is summarized in Table 1; details of the use of each grade and of use in end products are given in Appendix 1, Table 1-7.

Old Newspapers Supply and Demand

The most significant new information from the API surveys is the increase in planned domestic capacity to utilize old newspapers (ONP), but other important trends are also evident in this area. The key points are:

- U.S. newsprint manufacturers are increasing their recycled newsprint capacity substantially through 1995; consumption of ONP by that industry segment is expected to increase by over 1 million tons between 1988 and 1995, a 71 percent increase (Table 1-9). This may even understate what will really happen as more companies finalize and announce expansion.
- There will likely be a large increase in Canadian capacity to produce recycled newsprint (Canadian producers currently supply 58 percent of the U.S. newsprint market). In 1995, at least 700,000 tons of ONP are estimated to be exported from the U.S. to Canada for this purpose.
- North American newsprint producers have been expanding capacity substantially and, by 1991/92, will have sufficient capacity to satisfy newsprint demand past 1995. Thus, an estimated $1.1 billion that will be invested through 1995 to install ONP deinking capacity in North America is not largely required to supply the marketplace, except as needed to meet changing customer demand.
- With other increases in demand for ONP for other paper products and exports, ONP recovery will gradually accelerate (starting in 1991) to 50-plus percent in 1995.
- In addition, other uses of ONP have taken on new importance in this current period of plentiful collection. Uses such as animal bedding, hydromulch and molded pulp products could rise substantially in the future.
- The combination of all of these factors leads to a projected 1995 recovery of 8.0 million tons or 51.6 percent of new supply of newsprint (Figures 4 and 5), which suggests that supply and demand will be in balance at the national average recovery potential.

Table 1

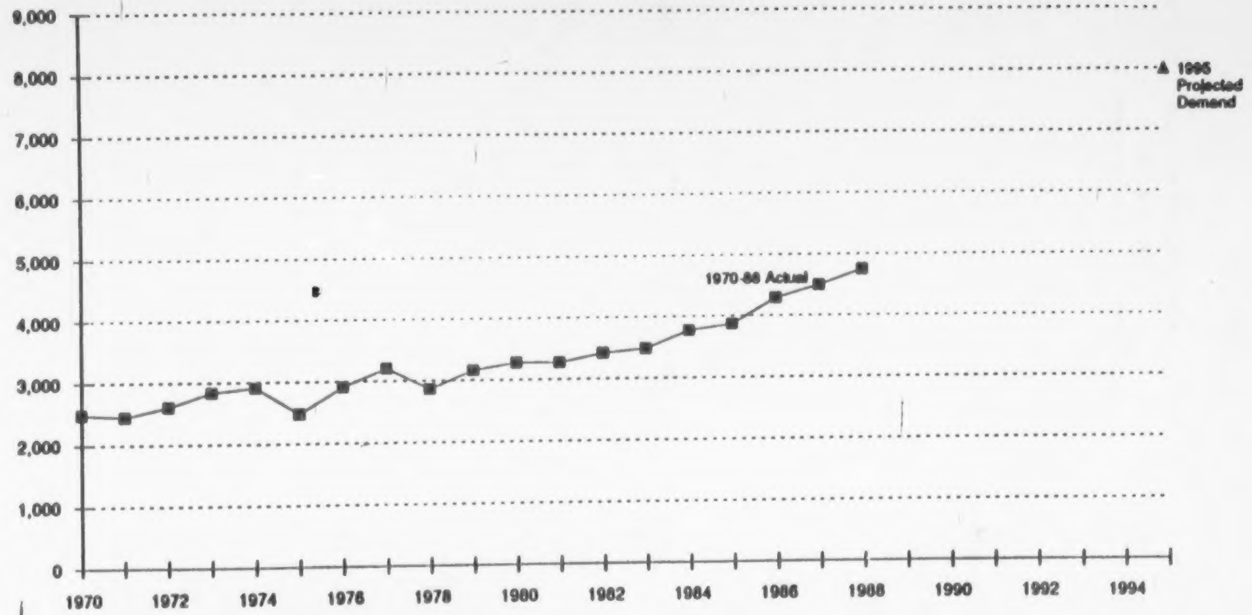
WASTE PAPER DEMAND BY GRADE CATEGORY
1988 AND 1995
(In million short tons and percent)

	1988		1995	
Waste Paper Grade	Actual	Recovery (Percent of Available)	Projected Demand	Recovery (Percent of Available)
News (ONP)	4.8	34.8%	8.0	51.6%
Corrugated	12.4	51.6%	18.8	66.0%
Mixed	2.9	13.0%	4.1	15.0%
Pulp Substitutes	3.6	100.0%	4.0	100.0%
High-Grade Deinking	2.5	37.0%	4.4	50.0%
Total	26.2	30.6%	39.3	38.5%

Source: Franklin Associates, Ltd.

Figure 4

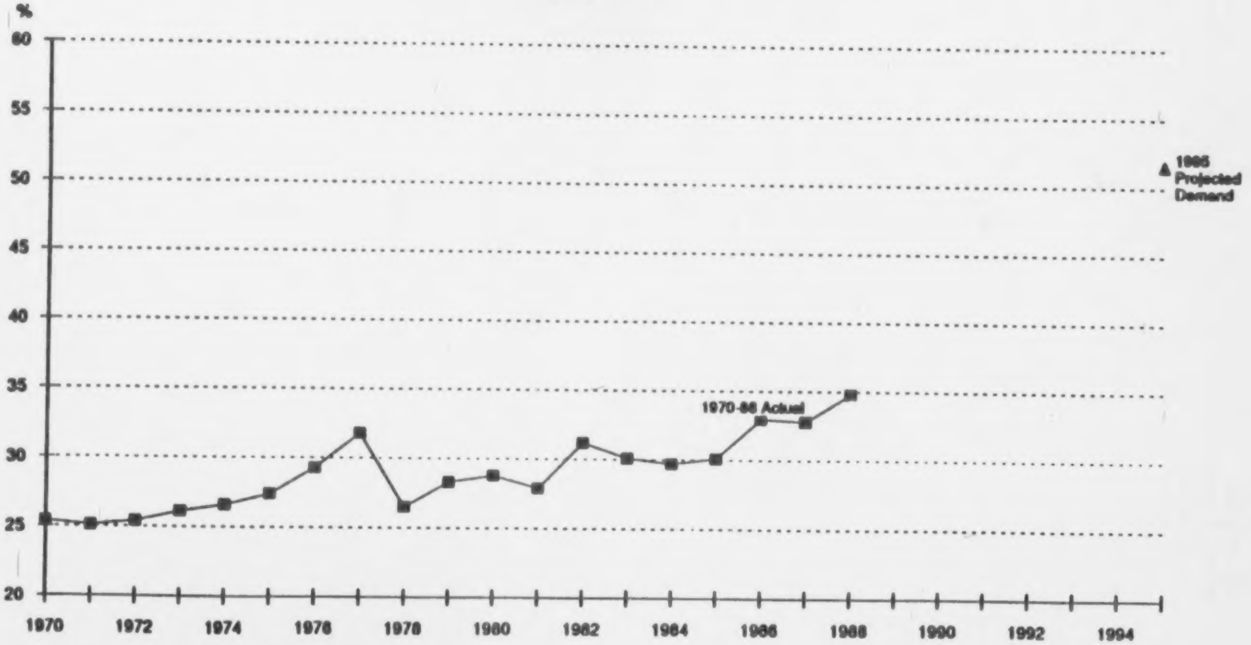
RECOVERY TREND FOR ONP - 1970 TO 1995
(in thousands of short tons)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

Figure 5

RECOVERY RATE TREND FOR ONP - 1970 TO 1995
(In percent)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

(The potential recovery of ONP was also examined in a more rigorous fashion based on recovery potential from households in metropolitan and rural areas, and on a state-by-state basis. This calculation is developed in Appendix 2.) Under intensive collection of ONP some communities and metropolitan areas will be able to significantly exceed the national average.

Corrugated Demand and Supply

Corrugated waste paper consists of box plant cuttings, which are about 15 percent of current recovery, and old corrugated containers (OCC), which are about 85 percent of current corrugated recovery. Corrugated has been, and will continue to be, the highest tonnage of the waste paper grades.

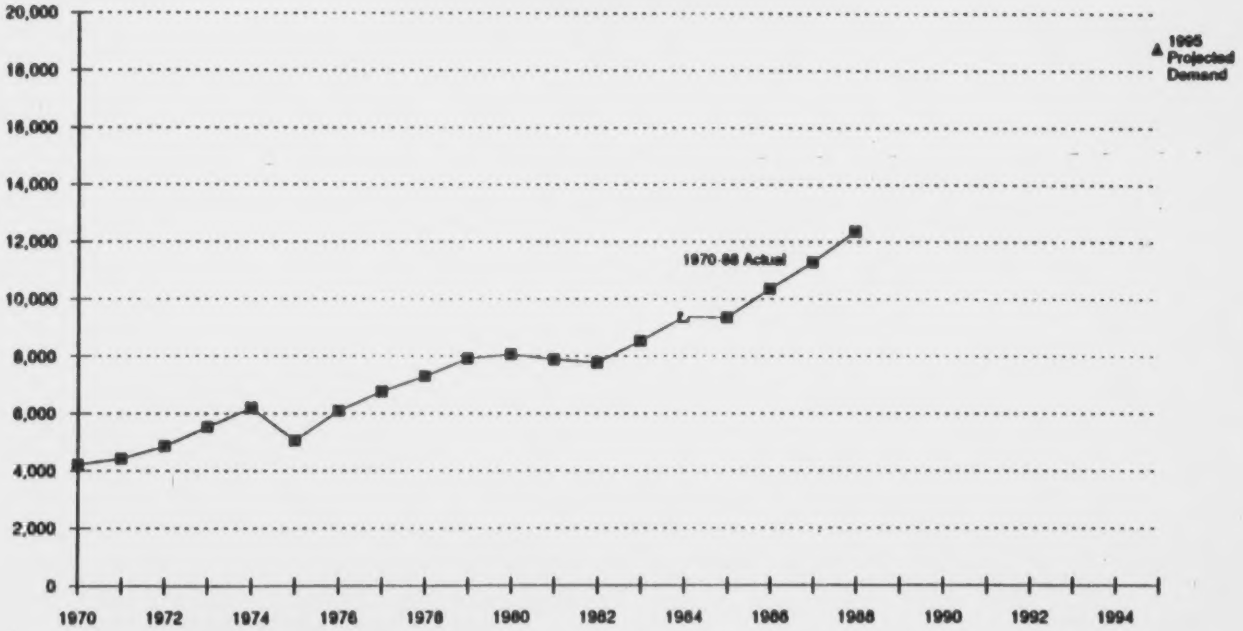
As in ONP, the capacity to utilize corrugated as a fiber furnish is increasing very rapidly. These increases are being driven by increased demand for containerboard; the economics of fiber supply; and the ability of the paper industry to increase production of linerboard and corrugating medium by incremental expansions and "greenfield" (new) mills.

Other key points:

- The projected capacity for 1995 and estimated actual usage indicate continued very strong increases for corrugated recycling, most of which will be post-consumer OCC because box plant cuttings are already fully utilized (Table 1-3).
- Exports of corrugated have shown very strong growth and increases are projected to 1995 in the same 50-plus percent range as domestic demand.
- The recovery of corrugated is projected at 18.8 million tons in 1995, compared to 12.4 million tons in 1988, a 51.6 percent increase (Figure 6). Over the same period, containerboard new supply will increase at less than half that rate, by 19.8 percent. Consequently, recovery rates will increase (Figure 7) to 63 percent of OCC.
- The recovery of OCC will be approaching the limits of recovery by 1995 using present techniques. Extensive interviews and consultation with waste paper dealers and others in the paper industry lead to the judgment that practical recovery levels are 60 to 65 percent by 1995.

Figure 6

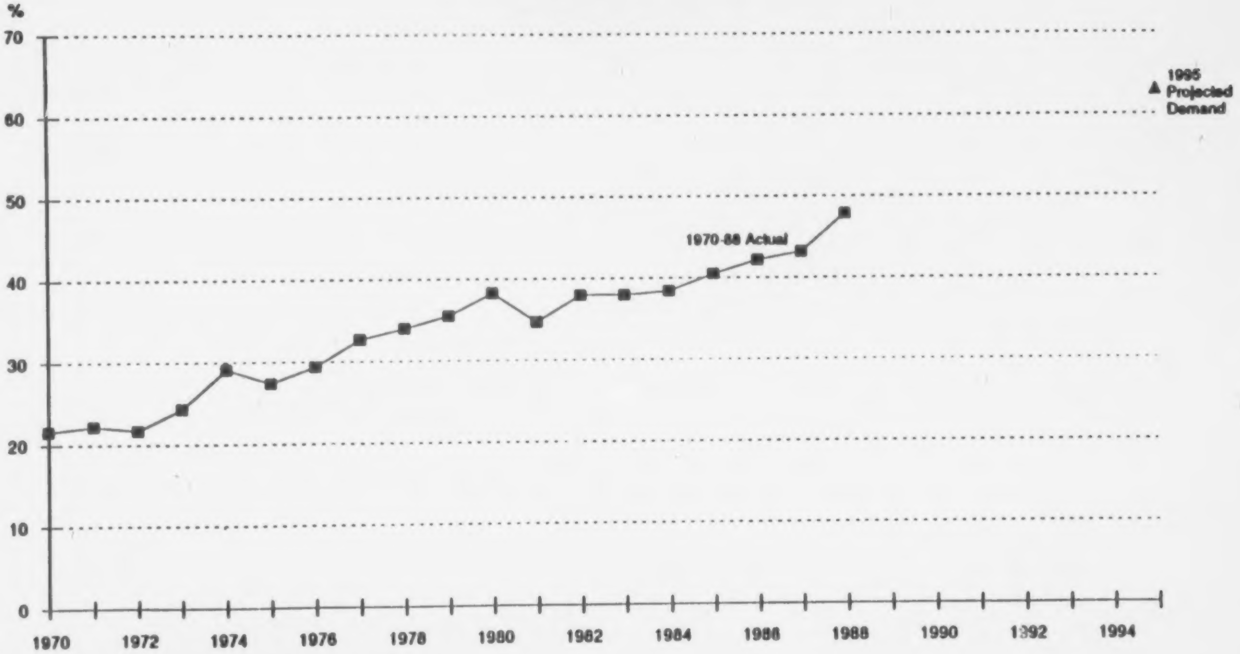
RECOVERY TREND FOR CORRUGATED - 1970 TO 1995
(In thousands of short tons)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

Figure 7

RECOVERY RATE TREND FOR OCC - 1970 TO 1995
(in percent)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

Mixed Papers Supply and Demand

Mixed papers is a "catch-all" category for uncontaminated waste paper that does not fit into other categories and includes unsorted office papers, magazines, envelopes, direct mail items and other household papers. Historically, the demand for this grade has been limited because of two factors: (1) the products for which mixed papers are most suitable have declined or not grown in demand; and (2) the technical problems of using mixed papers in other products are great.

Looking to the mid-1990s:

- There does seem to be some basis to expect increases in use of mixed papers. Their expanded use is expected in paperboard manufacturing, and export growth is forecast as well. Furthermore, newsprint producers that install flotation deinking systems will likely utilize magazines for a significant portion of their waste paper requirements.

- An estimated 4.1 million tons of mixed papers will be demanded in 1995, a 41 percent increase above the 2.9 million tons recovered in 1988 (Figure 8).

- Domestic use is expected to be about 2.9 million tons in 1985 (Table 1-11).

- Expanding use of mixed papers as a fiber source warrants examination of new methods to upgrade them to deinking grades of paper; research and development to find new ways to upgrade the fiber in the papermaking process; identifying alternative applications to use mixed papers to make products such as telephone books, catalogs, and the like; and exploring the feasibility of combusting nonrecyclable paper in existing industrial boilers to recover energy.

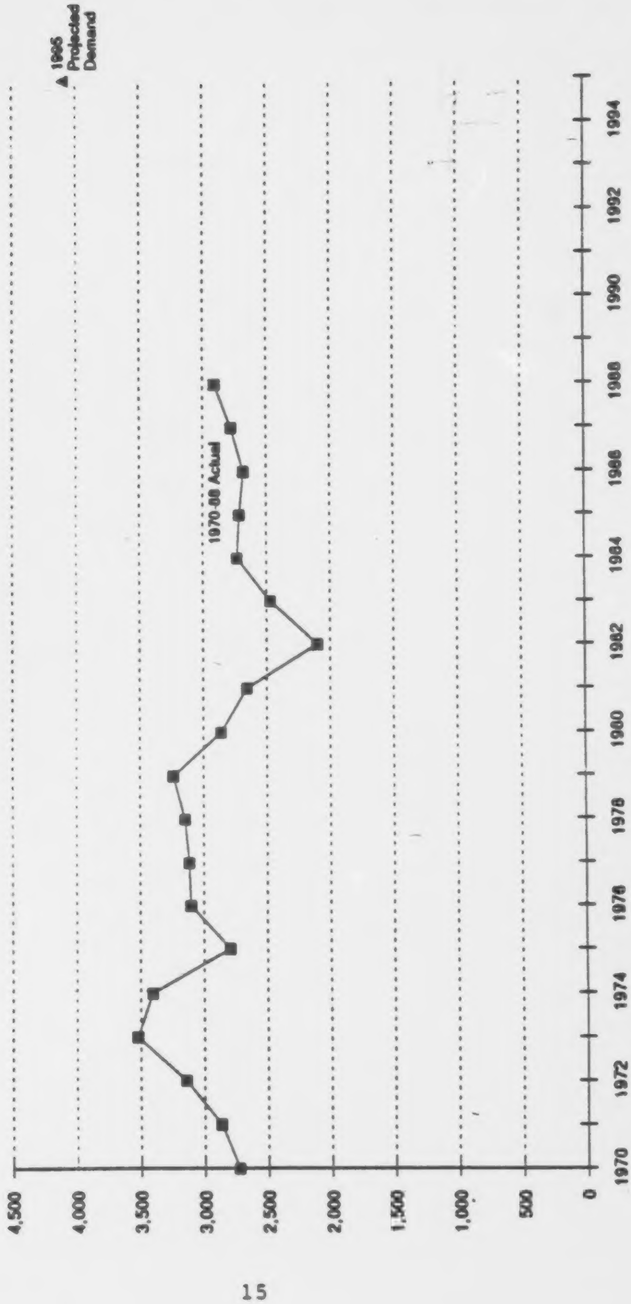
- Mixed papers will not readily yield to significantly greater consumption without special efforts over and above recovery. As a consequence, mixed papers are not likely to be collected in excess of demand in the next few years.

Pulp Substitutes

Pulp substitutes are the cuttings from virgin fiber paperboard, envelope cuttings and other unprinted converter scrap. By definition and practice, pulp substitutes are recovered at close to 100 percent of availability. In effect, the demand for pulp substitutes is virtually unlimited and the supply is constrained. The projection of demand can be

Figure 8

RECOVERY TREND FOR MIXED GRADES OF WASTE PAPER - 1970 TO 1995
(In thousands of short tons)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

considered to be at 100 percent recovery. In 1988, recovery was 3.5 million tons; by 1995, recovery will be an estimated 4.0 million tons (Figure 9).

High-grade Deinking Papers

High-grade deinking grades consist of papers like computer printout, sorted white office papers, printing plant scrap, printed converting scrap, and the like.

Deinking grades are in high demand and limited supply. The projection to 1995 assumes active office paper recovery projects spreading much more widely across the nation, almost in concert with community curbside collection programs. There is also some potential to upgrade mixed papers to deinking grade by labor or mechanical means. In 1988, the recovery of high-grade deinking papers was 2.6 million tons; in 1995, the recovery is projected at 4.4 million tons (Figure 10), 50 percent of available supply.

KEY CONCLUSIONS

A number of conclusions can be drawn from the preceding analysis. They are:

1. Economic forces within the paper industry and changing customer requirements driven by responses to municipal solid waste management pressures have led to a significant increase in the recovery and utilization of waste paper. This change began in 1986 and is projected to continue through 1995, the time frame for this report.

2. The 1989 API Paper, Paperboard, Wood Pulp Capacity report and Special Waste Paper Survey indicate a rapid acceleration of commitments to the use of waste paper as a fiber source by the paper industry beyond current trends.

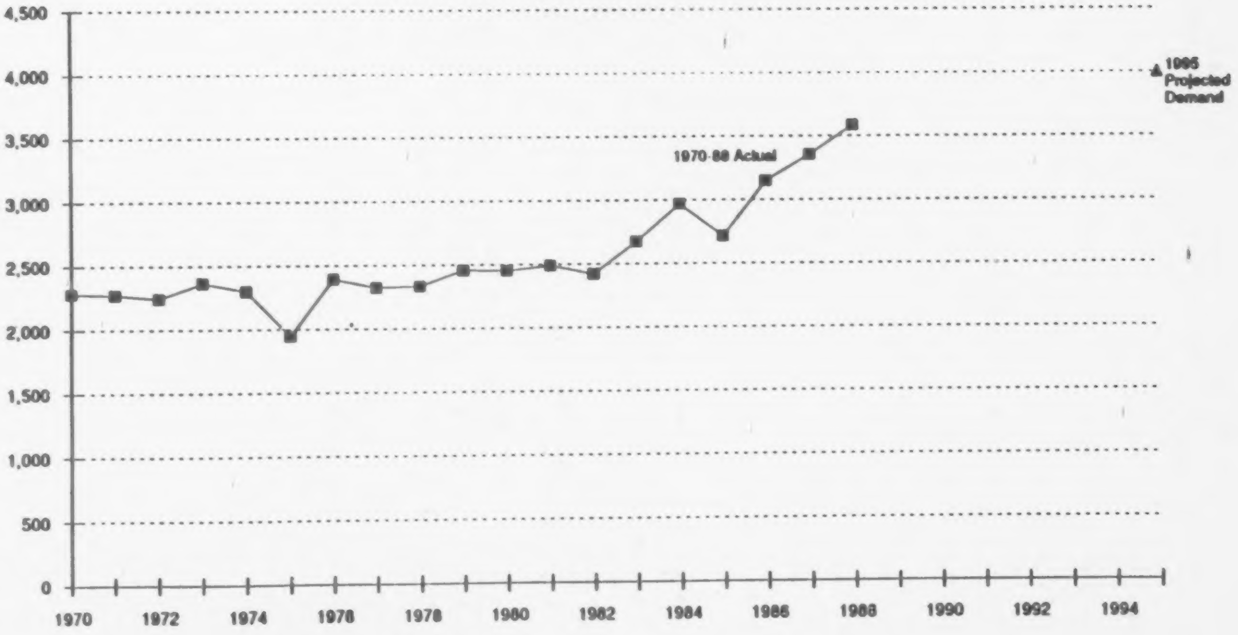
3. Worldwide demand for paper will continue to lead to increasing exports of all grades of recyclable paper from the U.S.

4. By 1995, the combination of waste paper demand within the paper industry, exports and all other uses will lead to the consumption of all waste paper that can be reasonably recovered in usable condition, except for mixed papers. By then, old newspapers, corrugated, high-grade deinking papers and pulp substitutes will be at or near their respective recovery potentials.

5. The nation's potential ability to collect mixed papers will probably exceed the ability to use and export

Figure 9

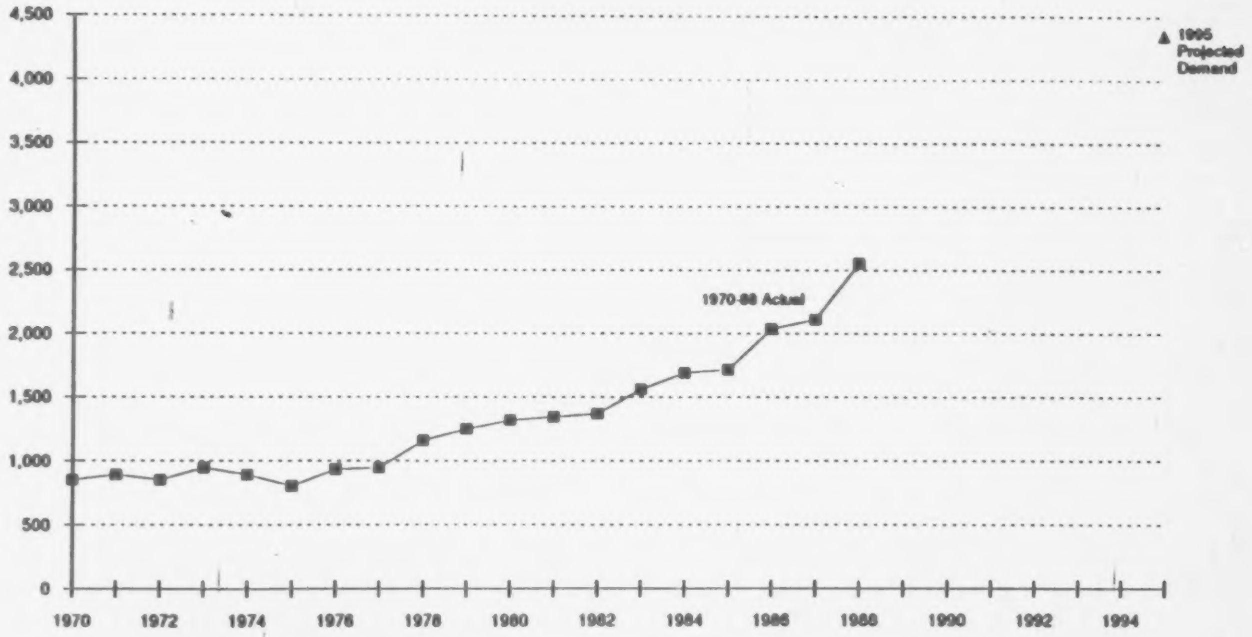
RECOVERY TREND FOR PULP SUBSTITUTES - 1970 TO 1995
(In thousands of short tons)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

Figure 10

RECOVERY TREND FOR HIGH GRADE DEINKING - 1970 TO 1995
(In thousands of short tons)



Source: American Paper Institute (Historical Data)
Franklin Associates, Ltd. (1995 Projected Demand)

these grades by 1995. While some mandatory collection pressures may develop, this activity is not likely to be widespread enough to generate supply significantly in excess of market requirements.

6. The recovery rate in 1995 for waste paper will be in the range of 38.5 percent to 41.7 percent of new supply, which will generate material approximately in balance with projected demand.

Appendix 1

DETAILED STATISTICS OF NEW SUPPLY, PAPER RECYCLING, AND WASTE PAPER CAPACITY TO 1995

(Prepared by Franklin Associates, Ltd.
based on API data)

Table 1-1

NEW SUPPLY OF PAPER AND PAPERBOARD
HISTORICAL DATA AND 1995 DEMAND PROJECTIONS
(In thousands of short tons)

	Paper Grades				Paperboard Grades				Total Paper-board	Construction/ Other	Total New Supply
	Newsprint	Printing/ Writing	Packaging/ Ind. Conv.	Tissue	Unbleached Kraft	Semi-chemical	Bleached Board	Recycled			
1970	9,797	11,033	5,139	3,698	9,858	3,434	3,229	6,974	23,495	2,972	56,134
1971	9,773	11,311	5,199	3,817	9,976	3,596	3,224	7,142	23,938	3,467	57,505
1972	10,269	12,329	5,497	3,957	11,381	3,898	3,468	7,142	25,889	3,650	61,591
1973	10,877	13,512	5,640	4,016	11,972	4,153	3,584	7,881	27,590	3,604	65,239
1974	10,955	13,409	5,587	4,062	11,760	4,029	3,453	7,557	26,799	3,301	64,113
1975	9,048	10,948	4,334	3,948	10,485	3,587	3,087	6,152	23,311	3,001	54,590
1976	9,917	13,296	5,151	4,166	12,089	3,986	3,538	7,131	26,744	3,367	62,641
1977	10,080	14,242	5,577	4,269	12,376	4,142	3,332	7,300	27,150	3,464	64,782
1978	10,788	15,248	5,754	4,206	12,938	4,368	3,546	7,483	28,335	3,737	68,068
1979	11,159	16,086	5,701	4,509	13,532	4,624	3,502	7,592	29,250	3,598	70,303
1980	11,377	16,140	5,243	4,318	12,959	4,432	3,313	7,012	27,716	2,968	67,762
1981	11,696	16,108	5,241	4,473	13,764	4,616	3,353	7,007	28,740	2,468	68,724
1982	10,948	16,217	5,014	4,428	12,639	4,251	3,119	6,495	26,504	2,025	65,136
1983	11,597	18,501	5,341	4,787	13,890	4,607	3,380	7,424	29,301	2,210	71,737
1984	12,721	20,473	5,447	4,934	15,169	5,124	3,533	7,689	31,515	2,222	77,312
1985	12,838	20,569	5,132	4,978	14,589	4,964	3,445	7,597	30,595	2,048	76,160
1986	12,994	22,066	5,076	5,140	15,513	5,263	3,639	8,126	32,541	1,845	79,662
1987	13,707	23,447	4,972	5,321	16,676	5,476	3,787	8,677	34,616	1,792	83,855
1988	13,670	24,826	5,043	5,495	16,930	5,673	3,884	8,830	35,317	1,781	86,132
1995	15,500	32,600	4,850	6,400	19,300	6,400	4,150	11,000	40,850	1,800	102,000
Annual Growth Rates (%):											
1978-1988	2.4	5.0	-1.3	2.7	2.7	2.6	0.9	1.7	2.2	-7.1	2.4
1988-1995	1.8	4.0	-0.6	2.2	1.9	1.7	0.9	3.2	2.1	0.1	2.4

Source: American Paper Institute Statistics of Paper and Paperboard, Table VIII (Historical Data).
Franklin Associates, Ltd. (1995 Demand Projections).

Table 1-2

WASTE PAPER RECOVERY AND DOMESTIC CONSUMPTION, 1970 TO 1995 HISTORICAL DATA AND 1995 DEMAND PROJECTIONS

(In thousands of short tons and percent)

Year	New Supply	Waste Paper Recovery	Percent Recovery	Domestic Paper & Board Production	Waste Paper Consumption	Percent Consumption
1970	55,969	12,562	22.4	51,671	12,021	23.3
1971	57,450	12,899	22.5	53,163	12,323	23.2
1972	62,040	13,699	22.1	57,434	13,132	22.9
1973	65,004	15,189	23.4	59,900	14,318	23.9
1974	63,308	15,689	24.8	59,040	14,198	24.0
1975	54,113	13,072	24.2	50,976	11,983	23.5
1976	62,015	15,419	24.9	58,329	13,822	23.7
1977	64,241	16,348	25.4	60,040	14,288	23.8
1978	67,787	16,791	24.8	62,047	14,972	24.1
1979	69,796	18,025	25.8	64,345	15,520	24.1
1980	67,102	17,971	26.8	63,536	15,094	23.8
1981	67,957	17,651	26.0	64,259	15,217	23.7
1982	64,640	17,078	26.4	60,962	14,620	24.0
1983	71,183	18,726	26.3	66,764	15,822	23.7
1984	76,958	20,528	26.7	70,268	16,882	24.0
1985	76,109	20,368	26.8	68,658	16,550	24.1
1986	79,724	22,522	28.2	72,475	18,128	25.0
1987	83,441	24,033	28.8	75,908	18,901	24.9
1988	85,412	26,179	30.7	77,993	19,886	25.5
1995	102,000	39,250	38.5	92,450	27,915	30.2

Source: American Paper Institute. "1989 Statistics of Paper Paperboard and Wood Pulp," Table XVIII, Economics and Financial Services Department, August 1989; "1988 Annual Statistical Summary of Waste Paper Utilization," Paper Recycling Committee, June 1989; "1988 Annual Statistical Summary," Newsprint Division, September 1989 (Historical Data).

Franklin Associates, Ltd. (1995 Demand Projections).

Table 1-3

CONTAINERBOARD NEW SUPPLY AND RECOVERY OF CORRUGATED, 1970 TO 1995
HISTORICAL DATA AND 1995 DEMAND PROJECTIONS
(In thousands of short tons and percent)

Year	Container-board New Supply	Finished Containers	Recovery: Converting Scrap	Recovery: Postconsumer OCC	Recovery: Total Corrugated	Percent Container-board	Percent OCC
1970	13,964	12,428	1,536	2,679	4,215	30.2	21.6
1971	14,363	12,783	1,580	2,836	4,416	30.7	22.2
1972	16,020	14,258	1,762	3,088	4,850	30.3	21.7
1973	16,934	15,071	1,863	3,659	5,522	32.6	24.3
1974	16,777	14,932	1,845	4,338	6,183	36.9	29.1
1975	14,586	13,127	1,459	3,593	5,052	34.6	27.4
1976	16,704	15,034	1,670	4,417	6,087	36.4	29.4
1977	17,182	15,464	1,718	5,049	6,767	39.4	32.7
1978	17,940	16,146	1,794	5,497	7,291	40.6	34.0
1979	18,884	16,996	1,888	6,028	7,916	41.9	35.5
1980	18,144	16,330	1,814	6,248	8,062	44.4	38.3
1981	19,140	17,226	1,914	5,975	7,889	41.2	34.7
1982	17,591	15,832	1,759	6,012	7,771	44.2	38.0
1983	19,291	17,362	1,929	6,605	8,534	44.2	38.0
1984	21,029	18,926	2,103	7,261	9,364	44.5	38.4
1985	20,158	18,142	2,016	7,345	9,361	46.4	40.5
1986	21,604	19,444	2,160	8,205	10,365	48.0	42.2
1987	23,091	21,888	1,847	9,450	11,297	48.9	43.2
1988	23,791	21,888	1,903	10,476	12,379	52.0	47.9
1995	28,500	26,220	2,280	16,520	18,800	66.0	63.0

Annual Growth Rates (%):

1970-1988	2.9
1988-1995	2.6

Source: American Paper Institute (Historical Data).
Franklin Associates, Ltd. (1995 Demand Projections).

Table 1-4

NEWSPRINT NEW SUPPLY AND RECOVERY OF ONP, 1970 TO 1995
HISTORICAL DATA AND 1995 DEMAND PROJECTIONS
(In thousands of short tons and percent)

Year	Newsprint New Supply	ONP Recovery	Percent Recovery
1970	9,797	2,485	25.4
1971	9,773	2,450	25.1
1972	10,269	2,607	25.4
1973	10,877	2,836	26.1
1974	10,955	2,910	26.6
1975	9,048	2,477	27.4
1976	9,917	2,906	29.3
1977	10,080	3,201	31.8
1978	10,788	2,862	26.5
1979	11,158	3,162	28.3
1980	11,377	3,279	28.8
1981	11,696	3,268	27.9
1982	10,948	3,415	31.2
1983	11,597	3,485	30.1
1984	12,721	3,773	29.7
1985	12,838	3,865	30.1
1986	12,994	4,288	33.0
1987	13,707	4,494	32.8
1988	13,670	4,753	34.8
1995	15,500	8,000	51.6

Source: American Paper Institute (Historical Data).
Franklin Associates, Ltd. (1995 Demand Projections).

Table 1-5

WASTE PAPER CONSUMED IN PAPER AND PAPERBOARD MANUFACTURE, EXPORTS AND OTHER USES
ACTUAL DEMAND - 1988
(in thousands of short tons and percent)

End Products	Total Production	Waste Paper as a Percent of Total Production	Total Waste Paper	Newspapers	Corrugated	Mixed Papers	Pulp Substitutes	High Grade Deinking
Total All Grades	77,993	25.5	19,886	3,215	9,909	2,181	2,890	1,691
Total Paper	38,298	14.8	5,650	1,618	395	201	2,004	1,432
Newsprint	5,982	23.9	1,431	1,431	0	0	0	0
Printing, Writing Papers	21,793	6.5	1,416	0	44	13	1,039	320
Packaging & Ind. Converting	5,047	5.3	265	10	75	14	160	6
Tissue	5,476	46.3	2,538	177	276	174	805	1,106
Total Paperboard	38,105	35.1	13,372	1,318	9,331	1,644	842	237
Unbleached Kraft	19,140	10.7	2,043	0	1,876	0	96	71
Bleached Kraft	4,512	0.0	0	0	0	0	0	0
Semi Chemical	5,664	32.6	1,845	10	1,722	56	57	0
Recycled	8,789	107.9	9,484	1,308	5,733	1,588	689	166
Construction Paper & Board	1,590	54.3	864	279	183	336	44	22
Other Uses	N.A.	-	500	500	0	0	0	0
Net Exports	N.A.	-	5,793	1,039	2,470	727	694	863
Grand Total	N.A.	-	26,179	4,754	12,379	2,908	3,584	2,554

Source: "1989 Statistics of Paper, Paperboard and Wood Pulp", Economic and Financial Services Dept, American Paper Institute, August 1989.
1989 API Capacity Survey, American Paper Institute, December 1989 (Waste Paper Consumed in Paper and Paperboard Manufacture).

Table 1-6

WASTE PAPER CONSUMED IN PAPER AND PAPERBOARD MANUFACTURE, EXPORTS AND OTHER USES DEMAND PROJECTIONS - 1992

(In thousands of short tons and percent)

End Products	Total Production	Waste Paper as a Percent of Total Production	Total Waste Paper	Newspapers	Corrugated	Mixed Papers	Pulp Substitutes	High Grade Deinking
Total All Grades	86,895	28.7	24,982	3,969	12,858	2,530	3,318	2,306
Total Paper	43,500	17.0	7,397	2,131	513	348	2,380	2,024
Newsprint	6,800	28.9	1,965	1,904	0	61	0	0
Printing, Writing Papers	25,800	6.3	1,636	0	45	15	1,184	392
Packaging & Ind. Converting	4,900	5.3	258	9	78	17	150	4
Tissue	6,000	59.0	3,537	218	390	255	1,046	1,628
Total Paperboard	41,800	39.7	16,593	1,484	12,141	1,801	906	261
Unbleached Kraft	21,000	14.5	3,035	0	2,856	0	98	81
Bleached Kraft	4,700	0.0	0	0	0	0	0	0
Semi Chemical	6,100	37.6	2,294	10	2,163	59	62	0
Recycled	10,000	112.6	11,264	1,474	7,122	1,742	746	180
Construction Paper & Board	1,595	62.2	992	354	204	381	32	21
Other Uses	N.A.	-	670	670	0	0	0	0
Net Exports	N.A.	-	8,490	1,970	3,230	1,000	780	1,510
Grand Total	N.A.	-	34,142	6,609	16,088	3,530	4,098	3,816

Source: 1989 API Capacity Survey, American Paper Institute, December 1989 (Waste Paper Consumed in Paper and Paperboard Manufacture).
Franklin Associates, Ltd. (1992 Demand Projections for Net Exports, Other Uses and Total Production).

Table 1-7

WASTE PAPER CONSUMED IN PAPER AND PAPERBOARD MANUFACTURE, EXPORTS AND OTHER USES
DEMAND PROJECTIONS - 1995

(in thousands of short tons and percent)

End Products	Total Production	Waste Paper as a Percent of Total Production	Total Waste Paper	Newspapers	Corrugated	Mixed Papers	Pulp Substitutes	High Grade Deinking
Total All Grades	93,250	29.9	27,915	4,515	15,000	2,900	3,150	2,350
Total Paper	47,450	17.1	8,115	2,715	500	600	2,250	2,050
Newsprint	7,400	36.5	2,700	2,450	0	250	0	0
Printing, Writing Papers	28,800	7.0	2,005	0	30	25	1,300	650
Packaging & Ind. Converting	4,850	5.2	250	35	40	25	150	0
Tissue	6,400	49.4	3,160	230	430	300	800	1,400
Total Paperboard	44,200	43.0	19,000	1,500	14,300	2,000	900	300
Unbleached Kraft	22,000	20.0	4,400	0	4,200	0	100	100
Bleached Kraft	4,800	0.0	0	0	0	0	0	0
Semi Chemical	6,400	40.6	2,600	0	2,500	50	50	0
Recycled	11,000	109.1	12,000	1,500	7,600	1,950	750	200
Construction Paper & Board	1,600	50.0	800	300	200	300	0	0
Other Uses	N.A.	-	820	820	0	0	0	0
Net Exports	N.A.	-	10,515	2,665	3,800	1,200	850	2,000
Grand Total	N.A.	-	39,250	8,000	18,800	4,100	4,000	4,350

Source: Franklin Associates, Ltd (1995 Demand Projections)

Table 1-8

TRENDS IN WASTE PAPER DEMAND FOR ALL GRADES - 1970 TO 1995

(In thousands of short tons)

	Domestic Demand								
Year	Paper (1)	Paper-board (1)	Constr Paper & Board (1)	Other Paper Uses (1)	Total Domestic Consumption (1)	Exports (1)	Total Consumption (1) (Demand)	Imports (1)	Total Recovery (1)
1970	2,228	8,330	1,463	200	12,221	408	12,629	67	12,562
1971	2,350	8,495	1,478	225	12,548	419	12,967	68	12,899
1972	2,458	9,080	1,594	240	13,372	415	13,787	88	13,699
1973	2,870	9,858	1,590	275	14,593	683	15,276	87	15,189
1974	2,663	9,890	1,643	275	14,471	1,307	15,778	89	15,689
1975	2,451	8,000	1,532	300	12,283	861	13,144	72	13,072
1976	2,929	9,203	1,690	430	14,252	1,273	15,525	106	15,419
1977	2,870	9,621	1,797	640	14,928	1,512	16,440	92	16,348
1978	3,177	10,002	1,793	290	15,262	1,599	16,861	70	16,791
1979	3,485	10,241	1,794	350	15,870	2,233	18,103	78	18,025
1980	3,721	9,830	1,543	300	15,394	2,664	18,058	87	17,071
1981	3,889	9,986	1,342	300	15,517	2,213	17,730	79	17,651
1982	4,019	9,546	1,055	300	14,920	2,232 (2)	17,152	74	17,078
1983	4,247	10,449	1,126	300	16,122	2,704 (2)	18,826	100	18,726
1984	4,708	11,217	957	300	17,182	3,456 (2,	20,638	110	20,528
1985	4,646	11,003	901	350 (2)	16,900	3,556 (2)	20,456	88	20,368
1986	5,141	12,095	892	400 (2)	18,528	4,093 (2)	22,621	99	22,522
1987	5,195	12,798	908	450 (2)	19,351	4,809 (2)	24,160	127	24,033
1988 (r)	5,650	13,372	864	500 (2)	20,386	5,953 (2)	26,339	160	26,179
1992 (3)	7,400	16,600	1,000	700	25,700	8,600	34,300	*	34,300
1995 (4)	8,115	19,000	800	820	28,735	10,515	39,250	*	39,250

Source: (1) "1988 Annual Statistical Summary of Waste Paper Utilization", June 1989; Paper Recycling Committee, API, except where noted.
(2) Revised based on data from "Annual Statistical Summary", September 1989; Newsprint Division, API.
(3) "Paper, Paperboard and Wood Pulp Capacity", December 1989; API and Franklin Associates, Ltd.
(4) Franklin Associates, Ltd.
(r) Revised
* Exports are treated as net exports in all projections.

Table 1-9

TRENDS IN ONP DEMAND - 1970 TO 1995
(In thousands of short tons)

	Domestic Demand											
Year	News-print (1)	Other Paper (1)	Total Paper (1)	Paper-board (1)	Constr Paper & Board (1)	Total Mill Consump-tion (1)	Other Uses (1)	Total Domestic Consump-tion (1)	Exports (1)	Total Consump-tion (1) (Demand)	Imports (1)	Total Recovery (1)
1970	371	84	455	1,473	307	2,235	200	2,435	82 (2)	2,517	32 (2)	2,485
1971	393	85	478	1,387	309	2,174	225	2,399	84 (2)	2,483	33 (2)	2,450
1972	421	64	485	1,504	328	2,317	240	2,557	83 (2)	2,640	33 (2)	2,607
1973	362	111	473	1,657	326	2,456	275	2,731	137 (2)	2,868	32 (2)	2,836
1974	406	100	506	1,548	354	2,408	275	2,683	261 (2)	2,944	34 (2)	2,910
1975	463	97	560	1,222	258	2,040	300	2,340	164	2,504	27 (2)	2,477
1976	522	118	640	1,343	295	2,278	430	2,708	244	2,952	46 (2)	2,906
1977	544	106	650	1,313	324	2,287	640	2,927	316	3,243	42	3,201
1978	532	121	653	1,225	334	2,212	290	2,502	366	2,868	6	2,862
1979	679	133	812	1,344	324	2,480	350	2,830	336	3,166	4	3,162
1980	852	163	1,015	1,244	305	2,564	300	2,864	425	3,289	10	3,279
1981	894	162	1,056	1,258	238	2,552	300	2,852	425	3,277	9	3,268
1982	1,066	144	1,210	1,257	206	2,673	300	2,973	454 (3)	3,427	12	3,415
1983	1,036	163	1,199	1,258	235	2,692	300	2,992	511 (3)	3,503	18	3,485
1984	1,258	175	1,433	1,246	216	2,895	300	3,195	594 (3)	3,789	16	3,773
1985	1,312	187	1,499	1,164	212	2,875	350 (3)	3,225	669 (3)	3,894	29	3,865
1986	1,364	202	1,566	1,293	259	3,118	400 (3)	3,518	802 (3)	4,319	31	4,288
1987	1,386	205	1,591	1,274	277	3,143	450 (3)	3,593	931 (3)	4,523	30	4,494
1988 (r)	1,431	187	1,618	1,318	279	3,215	500 (3)	3,715	1,069 (3)	4,784	30	4,753
1995 (4)	2,450	265	2,715	1,500	300	4,515	820	5,335	2,665	8,000	*	8,000

Source: (1) "1988 Annual Statistical Summary of Waste Paper Utilization", June 1989; Paper Recycling Committee, API, except where noted
(2) "Waste Paper, the Future of a Resource, 1980-2000", Franklin Associates, Ltd.
(3) Revised based on data from "Annual Statistical Summary", September 1989; Newsprint Division, API
(4) Franklin Associates, Ltd.
(r) Revised
* Exports are treated as net exports in all projections

Table 1-10

TRENDS IN CORRUGATED DEMAND - 1970 TO 1995

(In thousands of short tons)

	Domestic Demand										
Year	Paper (1)	Unbleach & Bleach Kraft (1)	Semi-Chemical (1)	Recycled (1)	Total Paper-board (1)	Constr Paper & Board (1)	Total Domestic Consump-tion (1)	Exports (1)	Total Consump-tion (1) (Demand)	Imports (1)	Total Recovery (1)
1970	108	182	622	2,995	3,779	183	4,080	155 (2)	4,235	20 (2)	4,215
1971	79	149	509	3,280	4,018	180	4,277	159 (2)	4,436	20 (2)	4,416
1972	97	213	608	3,581	4,402	223	4,722	158 (2)	4,880	30 (2)	4,850
1973	140	355	747	3,814	4,916	236	5,292	260 (2)	5,552	30 (2)	5,522
1974	137	401	756	4,137	5,294	285	5,716	497 (2)	6,213	30 (2)	6,183
1975	128	343	747	3,228	4,318	297	4,743	334	5,077	25 (2)	5,052
1976	156	445	909	3,848	5,202	338	5,696	426	6,122	35 (2)	6,087
1977	146	538	1,078	4,061	5,677	382	6,205	592	6,797	30	6,767
1978	206	590	1,112	4,396	6,098	417	6,721	577	7,298	7	7,291
1979	194	757	1,169	4,411	6,337	436	6,967	960	7,927	11	7,916
1980	244	871	1,152	4,200	6,223	399	6,866	1,209	8,075	13	8,062
1981	242	1,008	1,217	4,099	6,324	344	6,910	991	7,901	12	7,889
1982	217	1,136	1,318	3,787	6,241	312	6,770	1,012 (3)	7,782	11	7,771
1983	250	1,234	1,346	4,275	6,855	338	7,443	1,105 (3)	8,548	14	8,534
1984	259	1,331	1,576	4,562	7,469	244	7,972	1,409 (3)	9,381	17	9,364
1985	309	1,150	1,578	4,640	7,368	222	7,899	1,467 (3)	9,366	5	9,361
1986	308	1,561	1,607	4,931	8,099	227	8,634	1,738 (3)	10,372	7	10,365
1987	290	1,755	1,645	5,258	8,658	228	9,176	2,134 (3)	11,310	13	11,297
1988 (r)	395	1,876	1,722	5,733	9,331	183	9,909	2,482 (3)	12,391	12	12,379
1995 (4)	500	4,200	2,500	7,600	14,300	200	15,000	3,800	18,800	*	18,800

Source: (1) "1988 Annual Statistical Summary of Waste Paper Utilization", June 1989; Paper Recycling Committee, API, except where noted.
(2) "Waste Paper the Future of a Resource, 1980-2000", Franklin Associates, Ltd.
(3) Revised based on data from "Annual Statistical Summary", September 1989, Newsprint Division, API.
(4) Franklin Associates, Ltd.
(r) Revised
* Exports are treated as net exports in all projections

Table 1-11

TRENDS IN MIXED GRADE DEMAND - 1970 TO 1995
(In thousands of short tons)

Year	Domestic Demand Paper (1)	Paper-board (1)	Constr Paper & Board (1)	Total Domestic Consump-tion (1)	Exports (1)	Total Consump-tion (1) (Demand)	Imports (1)	Total Recovery (1)
1970	33	1,766	840	2,639	90 (2)	2,729	-	2,729
1971	62	1,860	854	2,776	92 (2)	2,868	-	2,868
1972	178	1,987	889	3,054	91 (2)	3,145	-	3,145
1973	317	2,136	918	3,371	150 (2)	3,521	-	3,521
1974	161	2,051	906	3,118	288 (2)	3,406	-	3,406
1975	200	1,550	856	2,606	187	2,793	-	2,793
1976	188	1,679	931	2,798	302	3,100	-	3,100
1977	152	1,646	975	2,773	342	3,115	-	3,115
1978	98	1,676	955	2,729	471	3,200	52	3,148
1979	107	1,604	937	2,648	648	3,296	57	3,239
1980	86	1,410	772	2,268	649	2,917	55	2,862
1981	104	1,462	667	2,233	474	2,707	50	2,657
1982	91	1,185	431	1,707	438 (3)	2,145	45	2,100
1983	97	1,373	438	1,908	625 (3)	2,533	62	2,471
1984	76	1,483	416	1,975	827 (3)	2,802	69	2,733
1985	82	1,415	405	1,902	854 (3)	2,756	44	2,712
1986	122	1,574	348	2,044	681 (3)	2,725	43	2,682
1987	78	1,687	352	2,117	725 (3)	2,842	65	2,777
1988 (r)	201	1,644	336	2,181	823 (3)	3,004	96	2,908
1995 (4)	600	2,000	300	2,900	1,200	4,100	*	4,100

Source: (1) "1988 Annual Statistical Summary of Waste Paper Utilization", June 1989; Paper Recycling Committee, API, except where noted.
(2) "Waste Paper the Future of a Resource, 1980-2000", Franklin Associates, Ltd.
(3) Revised based on data from "Annual Statistical Summary", September 1989, Newsprint Division, API
(4) Franklin Associates, Ltd
(r) Revised
* Exports are treated as net exports in all projections

Table 1-12

TRENDS IN PULP SUBSTITUTE DEMAND - 1970 TO 1995
(In thousands of short tons)

	Domestic Demand											
Year	News-print (1)	Printing Writing & Related (1)	Packag & Ind. Converting (1)	Tissue (1)	Total Paper (1)	Paper-board (1)	Constr Paper & Board (1)	Total Domestic Consumption (1)	Exports (1)	Total Consumption (1) (Demand)	Import's (1)	Total Recovery (1)
1970	0	474	68	364	906	1,187	123	2,216	81 (2)	2,297	15 (2)	2,282
1971	0	491	76	393	960	1,110	135	2,205	84 (2)	2,289	15 (2)	2,274
1972	0	478	138	355	971	1,062	152	2,185	83 (2)	2,268	25 (2)	2,243
1973	0	576	165	383	1,124	1,019	110	2,253	136 (2)	2,389	25 (2)	2,364
1974	0	560	164	358	1,082	882	98	2,062	261 (2)	2,323	25 (2)	2,298
1975	0	418	84	363	865	805	121	1,791	176	1,967	20 (2)	1,947
1976	0	553	137	414	1,104	887	126	2,117	300	2,417	25 (2)	2,392
1977	0	541	134	403	1,078	885	116	2,079	264	2,343	20	2,323
1978	1	529	128	620	1,278	879	87	2,242	93	2,335	2	2,333
1979	35	525	172	641	1,373	842	93	2,308	154	2,462	4	2,458
1980	46		171	624	1,343	848	63	2,254	206	2,458	9	2,450
1981	36	560	166	652	1,414	827	66	2,307	192	2,499	8	2,491
1982	35	699	129	558	1,421	743	83	2,247	180 (3)	2,427	6	2,421
1983	46	727	142	606	1,521	834	101	2,456	224 (3)	2,680	6	2,674
1984	12	852	222	645	1,731	861	82	2,674	302 (3)	2,976	6	2,970
1985	3	702	146	654	1,505	927	62	2,494	224 (3)	2,718	3	2,715
1986	1	910	183	655	1,749	956	57	2,762	390 (3)	3,152	3	3,149
1987	0	970	146	726	1,842	1,011	49	2,902	454 (3)	3,356	2	3,354
1988 (r)	0	1,039	160	805	2,004	842	44	2,890	697 (3)	3,587	3	3,584
1995 (4)	0	1,300	150	800	2,250	900	0	3,150	850	4,000	*	4,000
*												

Source: (1) "1988 Annual Statistical Summary of Waste Paper Utilization", June 1989, Paper Recycling Committee, API, except where noted.
(2) "Waste Paper the Future of a Resource, 1980-2000", Franklin Associates, Ltd.
(3) Revised based on data from "Annual Statistical Summary", September 1989, Newsprint Division, API
(4) Franklin Associates, Ltd.
(r) Revised
* Exports are treated as net exports in all projections

Table 1-13

TRENDS IN HIGH GRADE DEINKING DEMAND - 1970 TO 1995
(In thousands of short tons)

Year	Domestic Demand: Printing Writing & Related (1)	Domestic Demand: Packag & Ind. Converting (1)	Domestic Demand: Tissue (1)	Domestic Demand: Total Paper (1)	Domestic Demand: Paperboard (1)	Domestic Demand: Constr Paper & Board (1)	Domestic Demand: Total Domestic Consumption (1)	Exports (1)	Total Consumption (1) (Demand)	Imports (1)	Total Recovery (1)
1970	262 (2)	9 (2)	455 (2)	726	125 (2)	0 (2)	851	-	851	-	851
1971	271 (2)	10 (2)	490 (2)	771	120 (2)	0 (2)	891	-	891	-	891
1972	265 (2)	19 (2)	443 (2)	727	125 (2)	0 (2)	852	-	852	-	852
1973	318 (2)	22 (2)	476 (2)	816	130 (2)	0 (2)	946	-	946	-	946
1974	310 (2)	22 (2)	445 (2)	777	115 (2)	0 (2)	892	-	892	-	892
1975	231 (2)	12 (2)	455 (2)	698	106 (2)	0 (2)	803	-	803	-	803
1976	306	19	516	841	92	0	933	-	933	-	933
1977	360	4	480	844	100	0	944	-	944	-	944
1978	355	1	588	944	124	0	1,068	93	1,161	3	1,158
1979	305	1	693	999	114	4	1,117	135	1,252	2	1,250
1980	303	0	730	1,033	105	4	1,142	176	1,318	0	1,318
1981	308	7	758	1,073	115	27	1,215	130	1,345	0	1,345
1982	268	5	807	1,080	120	23	1,223	148 (3)	1,371	0	1,371
1983	279	5	896	1,180	129	14	1,323	239 (3)	1,562	1	1,561
1984	329	6	876	1,211	158	0	1,369	325 (3)	1,694	3	1,691
1985	304	6	942	1,252	129	0	1,381	342 (3)	1,723	7	1,716
1986	342	6	1,049	1,397	172	1	1,570	482 (3)	2,052	16	2,036
1987	336	7	1,051	1,394	168	2	1,564	566 (3)	2,130	18	2,112
1988 (r)	320	6	1,106	1,432	237	22	1,691	882 (3)	2,573	19	2,554
1995 (4)	650	0	1,400	2,050	300	0	2,350	2,000	4,350	*	4,350

Source: (1) "1988 Annual Statistical Summary of Waste Paper Utilization", June 1989; Paper Recycling Committee, API, except where noted.
(2) " Waste Paper the Future of a Resource, 1980-2000", Franklin Assoicates, Ltd
(3) Revised based on data from "Annual Statistical Summary", September 1989, Newsprint Division, API
(4) Franklin Associates, Ltd
(r) Revised
* Exports are treated as net exports in all projections

Table 1-14

TOTAL WASTE PAPER CONSUMPTION - 1988 TO 1992
(In thousands of short tons)

End Products	1988	1989 (1)	1990 (2)	1991 (2)	1992 (2)
Total All Grades	19,886	20,878	22,570	23,740	24,982
Total Paper	5,650	5,960	6,596	7,087	7,397
Newsprint	1,431	1,498	1,754	1,831	1,965
Printing, Writing, & Related	1,418	1,447	1,517	1,608	1,635
Packaging & Ind. Converting	265	253	253	255	259
Tissue	2,538	2,762	3,072	3,393	3,538
Total Paperboard	13,371	14,034	15,021	15,671	16,594
Kraft, Bleached, & Unbleached	2,042	2,311	2,694	2,830	3,035
Semichemical	1,845	1,935	2,063	2,093	2,294
Recycled Corrugating	2,081	2,165	2,343	2,436	2,483
Other Recycled	7,403	7,623	7,921	8,312	8,782
Construction Paper & Board	865	884	953	982	991

Source: API Capacity Survey, 1989.
(1) Estimated actual consumption.
(2) Estimated consumption of full capacity operations.

Table 1-15

ONP CONSUMPTION - 1988 TO 1992
(In thousands of short tons)

End Products	1988	1989 (1)	1990 (2)	1991 (2)	1992 (2)
Total All Grades	3,215	3,337	3,691	3,816	3,969
Total Paper	1,618	1,699	1,955	2,016	2,131
Newsprint	1,431	1,498	1,744	1,798	1,904
Printing, Writing, & Related	-	-	-	-	-
Packaging & Ind. Converting	10	9	9	9	9
Tissue	177	192	202	209	218
Total Paperboard	1,318	1,351	1,401	1,449	1,484
Kraft, Bleached, & Unbleached	-	-	-	-	-
Semichemical	10	10	10	10	10
Recycled Corrugating	14	16	16	17	17
Other Recycled	1,294	1,325	1,375	1,422	1,457
Construction Paper & Board	279	287	335	351	354

Source: API Capacity Survey, 1989.

(1) Estimated actual consumption.

(2) Estimated consumption of full capacity operations.

Table 1-16

CORRUGATED CONSUMPTION - 1988 TO 1992
(In thousands of short tons)

End Products	1988	1989 (1)	1990 (2)	1991 (2)	1992 (2)
Total All Grades	9,909	10,533	11,425	11,977	12,858
Total Paper	395	433	474	493	513
Newsprint	-	-	-	-	-
Printing, Writing, & Related	44	43	45	45	45
Packaging & Ind. Converting	75	78	81	79	78
Tissue	276	314	348	369	390
Total Paperboard	9,331	9,916	10,763	11,283	12,141
Kraft, Bleached, & Unbleached	1,878	2,127	2,511	2,651	2,856
Semichemical	1,722	1,815	1,932	1,961	2,163
Recycled Corrugating	2,016	2,098	2,275	2,366	2,414
Other Recycled	3,717	3,876	4,045	4,305	4,708
Construction Paper & Board	183	184	188	201	204

Source: API Capacity Survey, 1989.
(1) Estimated actual consumption.
(2) Estimated consumption of full capacity operations.

Table 1-17

MIXED PAPER CONSUMPTION - 1988 TO 1992
(In thousands of short tons)

End Products	1988	1989 (1)	1990 (2)	1991 (2)	1992 (2)
Total All Grades	2,181	2,243	2,342	2,458	2,530
Total Paper	201	230	264	304	348
Newsprint	-	-	9	33	61
Printing, Writing, & Related	13	15	15	15	15
Packaging & Ind. Converting	14	17	17	17	17
Tissue	174	198	223	239	255
Total Paperboard	1,644	1,669	1,718	1,776	1,801
Kraft, Bleached, & Unbleached	-	-	-	-	-
Semichemical	56	54	59	59	59
Recycled Corrugating	47	48	49	49	49
Other Recycled	1,541	1,567	1,610	1,668	1,693
Construction Paper & Board	336	344	360	378	381

Source: API Capacity Survey, 1989.

(1) Estimated actual consumption.

(2) Estimated consumption of full capacity operations.

Table 1-18

PULP SUBSTITUTE GRADES CONSUMPTION - 1988 TO 1992
(In thousands of short tons)

End Products	1988	1989 (1)	1990 (2)	1991 (2)	1992 (2)
Total All Grades	2,890	2,901	3,088	3,242	3,318
Total Paper	2,004	2,015	2,157	2,311	2,380
Newsprint	-	-	-	-	-
Printing, Writing, & Related	1,039	1,041	1,089	1,161	1,184
Packaging & Ind. Converting	160	149	144	145	150
Tissue	805	825	924	1,005	1,046
Total Paperboard	842	840	881	900	906
Kraft, Bleached, & Unbleached	96	103	102	97	98
Semichemical	57	56	62	62	62
Recycled Corrugating	3	3	3	3	3
Other Recycled	686	678	714	738	743
Construction Paper & Board	44	46	50	31	32

Source: API Capacity Survey, 1989.
(1) Estimated actual consumption.
(2) Estimated consumption of full capacity operations.

Table 1-19

HIGH GRADE DEINKING GRADES CONSUMPTION - 1988 TO 1992
(In thousands of short tons)

End Products	1988	1989 (1)	1990 (2)	1991 (2)	1992 (2)
Total All Grades	1,691	1,861	2,025	2,244	2,306
Total Paper	1,432	1,581	1,746	1,963	2,024
Newsprint	-	-	-	-	-
Printing, Writing, & Related	320	347	368	388	392
Packaging & Ind. Converting	6	2	2	4	4
Tissue	1,106	1,232	1,376	1,571	1,628
Total Paperboard	237	257	258	260	261
Kraft, Bleached, & Unbleached	71	81	81	81	81
Semichemical	-	-	-	-	-
Recycled Corrugating	-	-	-	-	-
Other Recycled	166	176	177	179	180
Construction Paper & Board	22	23	21	21	21

Source: API Capacity Survey, 1989.

(1) Estimated actual consumption.

(2) Estimated consumption of full capacity operations.

Table 1-20

COMPARISON OF API AND EPA RECOVERY ESTIMATES, 1988
(In thousands of short tons and percent)

	Newspapers	Corrugated	Recovery as Mixed, High Grade, or Pulp Subs Printing/ Writing	Tissue	Boxboard, Other Board	Paper Pkg, Special, Ind.	Construction	Total
New Supply (API)	13,670	23,791	24,826	5,495	11,526	5,043	1,781	86,132
Diversion (EPA)(1)	67	0	1,520	2,032	2,261	289	1,656	7,825
Converting Scrap (EPA) (Preconsumer Recovery)	342	1,903	2,955	275	1,959	250	125	7,809
Postconsumer Recovery (EPA)	4,412	10,476	2,942 (4)	0	340 (5)	200 (6)	0	18,370
Total Recovery (API)	4,754	12,379	5,897	275	2,299	450	125	26,179
Gross Discards (EPA) (2)	13,261	23,088	20,351	3,188	7,306	4,504	0	71,698
PC Recovery as % of Gross Discards (EPA)	33.3	45.4	14.5	0	4.7	4.4	0	25.6
Net Discards (EPA) (3)	8,849	12,612	17,409	3,188	6,966	4,304	0	53,328

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(1) Uses that do not meet the EPA definition of MSW. Includes permanent storage, toilet tissue, construction paper, board used in autos, and the like.
(2) New supply minus diversion and converting scrap plus 1.2 million tons for packaging of imported goods.
(3) Gross discards minus postconsumer recovery.
(4) Postconsumer printing/writing recovery estimated to come primarily from books and magazines (11% of gross discards), office papers (21%), and commercial printing (14%).
(5) Postconsumer boxboard and other board recovery estimated to come from folding cartons at 7% of gross discards.
(6) Postconsumer paper packaging recovery estimated to come primarily from bags and sacks at 7% of gross discards.

Source: Franklin Associates, Ltd.

Table 1-21

COMPARISON OF API AND EPA RECOVERY ESTIMATES, 1995
(In thousands of short tons and percent)

			Recovery as Mixed, High Grade, or Pulp Subs					
	Newspapers	Corrugated	Printing/ Writing	Tissue	Boxboard, Other Board	Paper Pkg, Special, Ind.	Construction	Total
New Supply (API)	15,500	28,500	32,600	6,400	12,350	4,850	1,800	102,000
Diversion (EPA)(1)	75	0	2,000	2,370	2,800	280	1,875	9,200
Converting Scrap (EPA) (Preconsumer Recovery)	390	2,280	3,885	320	2,100	245	125	9,345
Postconsumer Recovery (EPA)	7,610	16,520	5,015 (4)	0	360 (5)	400 (6)	0	29,905
Total Recovery (API)	8,000	18,800	8,900	320	2,460	645	125	39,250
Gross Discards (EPA) (2)	15,035	27,420	26,715	3,710	7,450	4,325	0	84,655
PC Recovery as % of Gross Discards (EPA)	50.6	60.2	18.8	0.0	4.8	9.2	0	35.3
Net Discards (EPA) (3)	7,425	10,900	21,700	3,710	7,090	3,925	0	54,750

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(1) Uses that do not meet the EPA definition of MSW. Includes permanent storage, toilet tissue, construction paper, board used in autos, and the like.
(2) New supply minus diversion and converting scrap plus 1.2 million tons for packaging of imported goods.
(3) Gross discards minus postconsumer recovery.
(4) Postconsumer printing/writing recovery estimated to come primarily from books and magazines (18% of gross discards), office papers (25%), and commercial printing (18%).
(5) Postconsumer boxboard and other board recovery estimated to come from folding cartons at 7% of gross discards.
(6) Postconsumer paper packaging recovery estimated to come primarily from bags and sacks at 12% of gross discards.

Source: Franklin Associates, Ltd.

Appendix 2

CALCULATION OF ONP RECOVERY POTENTIAL BY STATE, METROPOLITAN AREAS, AND RURAL AREAS

(Prepared by API)

Appendix 2

The methodology followed in this appendix is similar to that presented in a recent report sponsored by the Canadian Daily News Paper Publishers Association and the Canadian Pulp and Paper Association.* Data on four municipal curbside collection programs gave the average collection of ONP per household. These programs were weighted to yield an adjusted collection average of 160 pounds of ONP per year per household in metropolitan areas.

The data in Tables 2-1 and 2-2 were then developed based on API and Census data to determine the recovery potential for metropolitan areas. Table 2-1 develops the data based on shipments of newsprint to each state and the number of metropolitan households. The average per household was then normalized for consumption relative to national average. In Table 2-2, the potential collection per household for metropolitan areas was normalized based on 160 pounds per household per year. This resulted in a calculated recovery potential of 5.8 million tons, or 42.4 percent of 13.7 million tons consumed in 1987.

A factor was then developed for rural households based on a collection potential of one-third that of metropolitan households. This resulted in a national total of 0.46 million tons, or 3.4 percent of total consumption in 1987.

Then, an estimate of 5.0 percent overissue papers was added, giving a total recovery potential of 50.8 percent of new supply.

There are other refinements that could have been added, but the recovery potential is in the range that most industry experts have estimated. This methodology does assume that extensive community-based collection programs would be used in metropolitan areas by 1995.

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* "Newspapers and the Municipal Waste Issue in Ontario," 7-24-89. The Coopers & Lybrand Consulting Group. Toronto, Ontario, Canada (see pages 29 to 39).

Table 2-1

ALLOCATION OF NEWSPRINT CONSUMPTION IN METROPOLITAN AREAS BY STATE, 1987

(In pounds per household per year)

State	Households (000)	Percent Metropolitan	Newsprint Consumption (000 tons)	Per-Household Consumption	Relative Consumption Levels
Maine	447	36.1	77	345	113%
New Hampshire	391	56.3	33	169	55%
Vermont	204	23.1	21	206	68%
Massachusetts	2,190	90.7	432	395	130%
Rhode Island	369	92.6	89	482	158%
Connecticut	1,189	92.6	252	424	139%
New York	6,722	90.5	1,099	327	107%
New Jersey	2,807	100.0	731	521	171%
Pennsylvania	4,447	84.7	668	300	99%
Ohio	4,035	78.9	541	268	88%
Indiana	2,049	68.0	243	237	78%
Illinois	4,271	82.5	762	357	117%
Michigan	3,355	80.2	457	272	89%
Wisconsin	1,785	66.5	207	232	76%
Minnesota	1,585	66.2	202	255	84%
Iowa	1,072	43.1	137	256	84%
Missouri	1,940	66.0	249	257	84%
North Dakota	247	38.0	19	154	51%
South Dakota	264	28.7	17	129	42%
Nebraska	606	47.2	75	247	81%
Kansas	943	52.8	68	144	47%
Delaware	238	66.0	19	160	52%
Maryland	1,656	92.9	174	210	69%
District of Columbia	248	100.0	185	1,492	490%
Virginia	2,171	71.7	340	313	103%
West Virginia	707	36.3	63	178	59%
North Carolina	2,390	35.3	276	231	76%
South Carolina	1,199	60.4	101	168	55%
Georgia	2,258	64.6	358	317	104%
Florida	4,787	90.8	729	305	100%
Kentucky	1,366	45.8	157	230	75%
Tennessee	1,820	67.0	288	316	104%
Alabama	1,483	67.2	151	204	67%
Mississippi	909	30.3	45	99	33%
Arkansas	895	39.5	95	212	70%
Louisiana	1,566	69.0	167	213	70%
Oklahoma	1,244	58.8	101	162	53%
Texas	5,960	81.0	1,014	340	112%
Montana	303	24.2	16	106	35%
Idaho	357	19.6	24	134	44%
Wyoming	177	29.0	11	124	41%
Colorado	1,255	81.7	236	376	124%
New Mexico	533	48.4	40	150	49%
Arizona	1,240	76.2	201	324	106%
Utah	518	77.2	64	247	81%
Nevada	397	82.6	67	338	111%
Washington	1,761	81.2	194	220	72%
Oregon	1,074	67.6	168	313	103%
California	10,078	95.7	1,985	394	129%
Alaska	175	42.4	22	251	83%
Hawaii	345	76.7	36	209	69%
TOTAL U.S.	90,028		13,707	305	100%

Source: American Paper Institute

Table 2-2

POTENTIAL ONP COLLECTION FROM METROPOLITAN AREAS
(In short tons)

State	Metropolitan Households (000)	Potential Collection per Household (lb/year)	Potential Collection (000 lb)	Potential Collection (short tons)
Maine	161	181	29,211	14,606
New Hampshire	220	89	19,524	9,762
Vermont	47	108	5,098	2,549
Massachusetts	1,986	207	411,762	205,881
Rhode Island	342	253	86,608	43,304
Connecticut	1,101	223	245,226	122,613
New York	6,083	172	1,045,205	522,603
New Jersey	2,807	274	768,197	384,099
Pennsylvania	3,767	158	594,587	297,294
Ohio	3,184	141	448,569	224,285
Indiana	1,393	125	173,648	86,824
Illinois	3,524	187	660,639	330,320
Michigan	2,691	143	385,164	192,582
Wisconsin	1,187	122	144,660	72,330
Minnesota	1,049	134	140,529	70,265
Iowa	462	134	62,052	31,026
Missouri	1,280	125	172,702	86,351
North Dakota	94	81	7,587	3,794
South Dakota	76	68	5,127	2,564
Nebraska	287	130	37,201	18,601
Kansas	498	76	37,731	18,866
Delaware	157	84	13,178	6,589
Maryland	1,538	110	169,871	84,936
District of Columbia	248	784	194,414	97,207
Virginia	1,557	165	256,185	128,093
West Virginia	257	94	24,033	12,017
North Carolina	1,322	121	160,394	80,197
South Carolina	724	89	64,108	32,054
Georgia	1,459	167	243,036	121,518
Florida	4,347	160	695,614	347,807
Kentucky	626	121	75,565	37,783
Tennessee	1,219	166	202,779	101,390
Alabama	997	107	106,636	53,318
Mississippi	275	52	14,329	7,165
Arkansas	354	112	39,434	19,717
Louisiana	1,081	112	121,093	60,547
Oklahoma	731	85	62,410	31,205
Texas	4,828	179	863,134	431,567
Montana	73	55	4,069	2,035
Idaho	70	781	4,943	2,472
Wyoming	51	65	3,352	1,676
Colorado	1,025	198	202,623	101,312
New Mexico	258	79	20,345	10,173
Arizona	945	170	160,956	80,478
Utah	400	130	51,922	25,961
Nevada	328	177	58,158	29,079
Washington	1,430	116	165,544	82,772
Oregon	726	164	119,347	59,674
California	9,643	207	1,996,308	998,154
Alaska	74	132	9,803	4,902
Hawaii	265	110	29,017	14,509
TOTAL U.S.	69,245		11,613,626	5,806,813

Source: American Paper Institute

Table 2-2 (con't)

Notes:

New supply = 13,700,000

42.4% postconsumer (urban)
3.4% postconsumer (rural)
5.0% overissue
50.8% total

Collection assumption - 160 pounds

	Annual pounds per household	Relative state newsprint consumption	Adjusted collection
East Greenwich, RI	325	1.58	206
West Warwick, RI	188	1.58	119
Urbana, IL	219	1.17	187
Trenton, NJ	227	1.71	133
Avg.			161

Table 2-5

POTENTIAL ONP COLLECTION FROM RURAL AREAS
(in short tons)

State	Rural Households (000)	Potential Collection per Household @1/3 Urban (lb/year)	Potential Collection (000 lb)	Potential Collection (short tons)
Maine	286	60	17,234	8,617
New Hampshire	171	30	5,051	2,526
Vermont	157	36	5,656	2,828
Massachusetts	204	69	14,072	7,036
Rhode Island	27	84	2,307	1,154
Connecticut	88	74	6,532	3,266
New York	639	57	36,569	18,285
New Jersey	0	91	0	0
Pennsylvania	680	53	35,798	17,899
Ohio	851	47	39,983	19,992
Indiana	656	42	27,236	13,618
Illinois	747	62	46,707	23,354
Michigan	664	48	31,694	15,847
Wisconsin	598	41	24,289	12,145
Minnesota	536	45	23,914	11,957
Iowa	610	45	27,304	13,652
Missouri	660	45	29,653	14,827
North Dakota	153	27	4,126	2,063
South Dakota	186	23	4,246	2,123
Nebraska	321	43	13,870	6,935
Kansas	445	25	11,242	5,621
Delaware	81	28	2,263	1,132
Maryland	118	37	4,327	2,164
District of Columbia	0	261	0	0
Virginia	614	55	33,702	16,851
West Virginia	450	31	14,056	7,028
North Carolina	1,068	40	43,212	21,606
South Carolina	475	30	14,009	7,005
Georgia	799	56	44,389	22,195
Florida	440	53	23,491	11,746
Kentucky	740	40	29,805	14,903
Tennessee	601	55	33,289	16,645
Alabama	482	36	17,348	8,674
Mississippi	634	17	10,986	5,493
Arkansas	541	37	20,131	10,066
Louisiana	485	37	18,133	9,067
Oklahoma	513	28	14,575	7,288
Texas	1,132	60	67,481	33,741
Montana	230	18	4,248	2,124
Idaho	287	24	6,759	3,380
Wyoming	126	22	2,736	1,368
Colorado	230	66	15,127	7,564
New Mexico	275	26	7,229	3,615
Arizona	296	57	16,756	8,378
Utah	118	43	5,111	2,556
Nevada	69	59	4,083	2,042
Washington	331	39	12,775	6,388
Oregon	346	55	19,065	9,533
California	433	69	29,896	14,948
Alaska	101	44	4,438	2,219
Hawaii	80	37	2,938	1,469
TOTAL U.S.	20,783		929,841	464,920

Source: American Paper Institute

Appendix 3

AN AGGREGATE ANALYSIS OF FOREIGN DEMAND FOR U.S. WASTE PAPER

(Prepared by API)

AN AGGREGATE ANALYSIS OF FOREIGN DEMAND FOR U.S. WASTE PAPER

The accompanying table demonstrates that demand for U.S. waste paper exports could reach 11.0-14.2 million tons by 1995 assuming that paper and paperboard consumption outside the U.S. grows at a moderate rate through the mid-1990's and that the weighted average waste paper recovery rate for all countries except the U.S. edges up only slightly. The historical data in the accompanying table were obtained from Pulp & Paper International. The projections shown by the table are based on country-by-country analyses of waste paper recovery rates and other factors that influence waste paper demand.

Column 1 of the table provides data for world consumption of paper and paperboard excluding the U.S. In order to ascertain the sensitivity of the waste paper demand projections to varying economic assumptions, two scenarios of paper and paperboard consumption outside the U.S. were selected for the forecast period. Under the low-case scenario, rest-of-world paper and paperboard consumption grows at an average annual rate of 2.5% a year from 1988 to 1995 to a level of 193.5 million short tons. The high-case scenario assumes a 3.5% growth rate, which brings 1995 rest-of-world paper and paperboard consumption to 207 million tons.

The second column shows the average waste paper recovery rate for all countries except the U.S. A country-by-country analysis suggests that the average recovery rate for all countries except the U.S. will edge up from 35.3% in 1988 to about 36% in 1995. It is important to note that representatives of the pulp and paper industries of several major waste paper consuming nations, including Japan and South Korea, have indicated that their domestic waste paper recovery rates are approaching peak potential, suggesting that substantial increases are unlikely. Furthermore, recovery rates in several developing countries, such as China, are unlikely to experience significant gains due to the high utilization of non-wood fibers for paper and paperboard production and to the significant use of waste paper in non-paper making applications.

Column 3 shows actual tonnage of waste paper recovery outside the U.S. in 1986 and 1988. The projected 1995 recovery outside the U.S. was obtained by multiplying anticipated rest-of-world paper and paperboard consumption (column 1) by 36%, which is the expected 1995 recovery rate for waste paper outside the U.S. (See column 2). Based on these calculations, the 1995 range for waste paper recovery outside the U.S. is expected to be 69.7-74.6 million short tons.

Column 4 shows historical data and projections of rest-of-world waste paper utilization for all regions except the U.S. The projections are premised on the assumption that waste paper utilization outside the U.S. will increase at a 3.5-4.9% average annual rate in the 1990-95 period, or 1-1.4 percentage points a year faster than rest-of-world paper and paperboard production.

These assumptions may be regarded as conservative in view of the fact that waste paper utilization grew 3.3 percentage points a year faster than rest-of-world paper and paperboard output in the 1986-88 period. Moreover, a recent long-term econometric study of world paper and paperboard demand prepared by the Food and Agriculture Organization of the United Nations (FAO) indicates that waste paper use in the rest of the world will grow 1.4 percentage points a year faster than paper and paperboard production during the 1990-95 time frame.

The rapid growth of waste paper usage relative to paper/paperboard production is at least partly a reflection of changes in the geographical distribution of world paper and paperboard capacity. In particular, an increasing share of world paper and paperboard capacity is being located in Asian nations that tend to have high utilization rates for recycled fiber. Environmental concerns may lead to increased waste paper utilization, particularly in developed countries.

Column 5 measures the potential for U.S. exports of waste paper. The data pertaining to 1995 were obtained by subtracting world waste paper recovery excluding the U.S. (column 3) from anticipated world waste paper utilization (column 4). The range for 1995 works out to 11.0-14.2 million short tons, depending on how fast rest-of-world paper and paper and paperboard consumptions grows.

The range of potential U.S. waste paper exports simply demonstrates that the rest of the world will be able to absorb our fiber if it is available. Actual U.S. exports may fall short of the 11.0-14.2 million short ton range in 1995 due to growing U.S. paper stock consumption and practical limits to the domestic recovery of the most desired grades of waste paper.

POTENTIAL U.S. WASTE PAPER EXPORTS
(million short tons)

	(1) World Paper/Paperbd. Consumption (ex. U.S.) (mil. tons)	(2) World Recovery Rate (ex. U.S.) (percent)	(3) World Waste Paper Recovery (ex. U.S.)	(4) World Waste Paper Utilization (ex. U.S.) (mil tons)	(5) Potential U.S. Exports
1986	145.1	33.7%	48.9	53.0	4.1
1988	162.8	35.3%	57.5	63.5	6.0
			Projections		
1995(L)	193.5	36.0%	69.7	80.7	11.0
1995(H)	207.1	36.0%	74.6	88.8	14.2
Avg. % growth:					
1986-88	5.9%		8.4%	9.5%	21.0%
1988-95(L)	2.5%		2.8%	3.5%	9.0%
1988-95(H)	3.5%		3.8%	4.9%	13.1%

Source: Historical data from Pulp and Paper International and API . Projections were prepared by API's International/Economics Departments

Appendix 4

AGGREGATE RESULTS OF THE API SPECIAL WASTE PAPER SURVEY THROUGH 11-28-89 (Prepared by API)

Appendix 4

RESULTS OF API SPECIAL WASTE PAPER SURVEY*
WASTE PAPER CONSUMPTION AS FURNISH FOR PAPERMAKING
(in thousands of short tons)

As Reported in API Capacity Survey

	Mixed	News	Corrugated	Pulp Substitutes	High Grade Deinking	Total
1992	2,531	3,970	12,857	3,318	2,307	24,983

As Reported in API Special Waste Paper Survey

	Mixed	News	Corrugated	Pulp Substitutes	High Grade Deinking	Total
1992	2,662	4,717	14,004	3,472	2,549	27,403
1995	2,978	5,438	16,201	3,597	3,149	31,364

---

* Note that the 1992 Capacity Survey numbers shown in the upper panel of this table include projects that have received firm commitments.

The Special Waste Paper Survey data for 1992 and 1995, shown in the lower panel of the table,include all projects and additional usage under consideration that appear likely, but may not yet be absolutely firm.

Source: American Paper Institute.

Planned Expansion Announcements Based on the Utilization of Waste Paper (by state)

State	City	Name of Paper Mill	Type of Waste Paper Expansion	To Be Added
Alabama	Mobile	Mobile Paperboard	recycled paperboard	new machine
	Pine Hill	MacMillan Bloedel Ltd.	containerboard	additional capacity
	Mahrt	Mead Corp.	paperboard	new mill
California	Pomona	Golden State Paper Co.	newsprint	new machine
	Stockton	Daishowa America	containerboard	new mill
	Stockton	Newark Group	recycled paperboard	additional capacity
Connecticut	Sprague	Federal Paper Board Company	recycled paperboard	additional capacity
	Uncasville	Stone Container	containerboard	new machine
Florida	Hialeah	Atlas Paper Mills	tissue	new machine
	Jacksonville	Seminole Kraft (Stone Container)	containerboard	new machine

PRINTED ON RECYCLED PAPER

State	City	Name of Paper Mill	Type of Waste Paper Expansion	To Be Added
Georgia	Augusta	Augusta Newsprint Company	newsprint	deinking plant
	Dublin	Southeast Paper Manufacturing Co.	newsprint	new machine
	Rincon	Fort Howard Corp.	tissue	new machine
	Macon	Macon Kraft Inc.	containerboard	additional capacity
Illinois	Alsip	FSC Corp.	tissue	new machine
Indiana	Hartford City	VISY Board Packaging Co.	recycled containerboard	new mill
	Newport	Temple Inland Inc.	recycled containerboard	additional capacity
	Terre Haute	Weston Paper & Mfg Co.	containerboard	additional capacity
Kentucky	Maysville	Temple Inland Inc.	recycled containerboard	new mill
Michigan	Otsego	Menasha Corp.	containerboard	additional capacity
Missouri	St. Joseph	Mi Ho Paper Co.	printing/writing	122,000 tons/yr. 50% waste paper
Montana	Missoula	Stone Container	containerboard	retrofit

State	City	Name of Paper Mill	Type of Waste Paper Expansion	To Be Added
New Jersey	Clifton	Recycled Paperboard Co.	recycled paperboard	start up of idle mill
New York	Niagara Falls	Cascade Niagara Falls Inc.	printing/writing	100,000 tons/yr.
	Dunkirk	Trans-Rim Ltd.	containerboard	new mill
	Lockport	Domtar Industries Inc.	gypsum board	additional capacity
	Mechanicville	Tagsons Papers Inc.	tissue	additional capacity
Ohio	Baltimore	Fairfield Paper Co.	recycled linerboard	additional capacity
Oklahoma	Muskogee	Fort Howard Paper Co.	tissue	new machine
	Muskogee	Kenaf of North America Inc.	recycled containerboard	new mill
Oregon	Klamath Falls	Westbrook Wood Products Co.	newsprint	new mill
	Halsey	James River Corp.	tissue	retrofit for waste paper
Pennsylvania	Northampton	Northampton Paperboard Co.	containerboard	new mill

State	City	Name of Paper Mill	Type of Waste Paper Expansion	To Be Added
Tennessee	Calhoun	Bowater Inc.	newsprint	new deinking plant
	Loudon	Kimberly-Clark Corp.	tissue	additional capacity
Texas	Forney	Corrugated Services Inc.	recycled containerboard	additional capacity
Virginia	West Point	Chesapeake Corp.	containerboard	additional capacity
	Riverville	Virginia Fibre Corp.	containerboard	additional capacity
Washington	Longview	North Pacific Paper Corp. (Weyerhaeuser Co.)	newsprint	new machine
	Longview	Longview Fibre Co.	containerboard	retrofit
Wisconsin	Green Bay	James River Corp.	printing/writing	deink 90,000 tons/yr.
	Green Bay	Fort Howard Corp.	tissue	new machine
	Kaukauna	Fox River Fiber	waste paper market pulp	new mill
	Menasha	Chesapeake Corp.	tissue	new machine
	Menasha	U.S. Paper Mills Co.	recycled paperboard	new machine
	Tomahawk	Ponderosa Fibres of America, Inc.	waste paper market pulp	new machine

State	City	Name of Paper Mill	Type of Waste Paper Expansion	To Be Added
Northeast-no city announced		Smurfit Newsprint Co.	newsprint	new mill
West Coast-no city announced		James River Corp.	waste paper pulp	new mill

Note:
This listing has been compiled by the American Paper Institute, Inc. based on public company announcements of expansion plans. It is subject to change.

American Paper Institute, Inc.
May 16, 1990

ANPA
TO ADVANCE THE CAUSE OF A FREE PRESS
American Newspaper Publishers Association
Mailing Address: Box 17407 Dulles Airport, Washington, D.C. 20041
Offices: The Newspaper Center, 11600 Sunrise Valley Dr., Reston, Va. 22091 (703) 648-1000

Newsprint Recycling Projects - North America

1990-1992

Scheduled newsprint recycling projects for 1990-1992 using secondary fiber in the furnish (page 2-3) including speed-ups to the extent they are known to ANPA, will amount to an estimated 2.9 million metric tons (3.2 short tons) to North American recycled newsprint capacity.

In addition, at least 22 other projects are under consideration (pages 4-6). Planned capacity for 18 of the projects has not been disclosed. The capacity for the other 4 will amount to an estimated 742,000 metric tons (819,000 short tons). While we believe the projects under consideration are still active, we cannot guarantee this to be so.

ANPA Newsprint Department
July 18, 1990

Newsprint Recycling Projects

(Full Capacity May Not Be Realized In Start-up Year)

Company	Location	Recycled Capacity (000's Tons) Metric	Recycled Capacity (000's Tons) Short
	1990		
Atlantic Packaging Products Ltd.	Whitby, Ontario (New mill plus de-inking line)	136	150
Augusta Newsprint Company	Augusta, Georgia (de-inking line)	363	400
Smurfit Newsprint	Pomona, California (Speed-up)	15	17
		514	567
	1991		
Alabama River Newsprint Company	Claiborne, Alabama (de-inking line)	220	243
Bowater Inc.	Calhoun, Tennessee (de-inking line)	236	260
Canadian Pacific Forest Products Limited	Gatineau, Quebec (de-inking line)	440	485
	Thunder Bay, Ontario (de-inking line)	240	265
Inland Empire Paper Company	Millwood, Washington (de-inking line)	72	79
Kruger Inc.	Bromptonville, Quebec (de-inked pulp) Trois-Rivieres, Quebec (de-inked pulp)	50	55
North Pacific Paper Company	Longview, Washington (new machine plus de-inking line)	700	772
		1,958	2,159

Newsprint Recycling Projects

(Full Capacity May Not Be Realized In Start-up Year)

Company	Location	Recycled Capacity (000's Tons) Metric	Recycled Capacity (000's Tons) Short
	1992		
Abitibi-Price Inc.	Ontario (de-inking line)	unknown	unknown
Champion International Corporation	Sheldon, Texas (de-inking line)	429	473
Daishowa Forest Products Ltd.	Quebec, Quebec (de-inking line)	unknown	unknown
		429	473
		2,901	3,199

Newsprint Recycling Projects Under Consideration

Company	Location	Recycled Capacity (000's Tons) Metric	Recycled Capacity (000's Tons) Short
Atlantic Packaging Products Ltd.	Whitby, Ontario (new machine)	unknown	unknown
Alberta Newsprint Company	Whitecourt, Alberta (de-inking line)	unknown	unknown
Bear Island Paper Company	Ashland, Virginia (de-inking line)	unknown	unknown
Boise Cascade Corporation	Steilacoom, Washington (de-inking line)	unknown	unknown
Bowater, Inc.	Catawba, South Carolina (de-inking line)	unknown	unknown
Bowater Mersey Paper Company Limited	Liverpool, Nova Scotia (de-inking line)	unknown	unknown
Cascades Inc. & Steinbeis & Consortium GmbH	Montreal, Quebec East Angus, Quebec or Niagara Falls, New York (de-inking line)	unknown	unknown
Donohue Inc.	Clermont, Quebec (de-inking line)	unknown	unknown
or	or		
Donohue Inc. & James MacLaren Industries Inc.	Montreal, Quebec (de-inking line)	unknown	unknown
Garden State Paper Company Inc.	Northeastern U. S. (new mill plus de-inking line)	220	243
Georgia Pacific Corp	East Millinocket, Maine (de-inking line)	unknown	unknown

Newsprint Recycling Projects Under Consideration

Company	Location	Recycled Capacity (000's Tons) Metric	Recycled Capacity (000's Tons) Short
James MacLaren Industries Inc.	Masson, Quebec (de-inking line)	unknown	unknown
Newstech Recycling Inc. (Subsidiary of Balaclava Ent.)	Coquitlam, British Columbia (new de-inking plant)		
	MacMillan Bloedel Ltd. and Fletcher Challenge Canada Limited are considering purchasing recycled pulp for use in their paper mills.	unknown	unknown
Orford Recycling	Drummondville, Quebec (de-inking)	unknown	unknown
Papiers Cascades, Inc./Steinbeis	Cap-de-le Madeleine, Quebec (de-inking line and new machine)	50	55
Smurfit Newsprint	Northeastern U.S. (new mill plus de-inking line)	250	276
	Pomona, California (new machine)	222	245
F. F. Soucy Inc.	Riviere-du-Loup, Quebec (de-inking line)	unknown	unknown
Southeast Paper Manufacturing Company	Unknown (new mill plus de-inking line)	unknown	unknown
Stone-Consolidated Inc.	Unknown (de-inking line)	unknown	unknown
Unknown	Alberta	unknown	unknown

Newsprint Recycling Projects Under Consideration

Company	Location	Recycled Capacity (000's Tons) Metric	Recycled Capacity (000's Tons) Short
Stora Forest Industries Ltd.	Port Hawkesbury, Nova Scotia (de-inking line)	unknown	unknown

Newsprint Machine Conversions Under Consideration

Company	Location	Year	Recycled Capacity (000's Tons) Metric	Recycled Capacity (000's Tons) Short
Smurfit Newsprint	Oregon City, Oregon one or more older machines - conversion to other grades of paper)	unknown	unknown	unknown

THE STATES' ROLE IN DOCUMENTING THE RECOVERY AND RECOVERABILITY OF NEWSPAPERS FOR RECYCLING

Prepared for
The Newsprint Resource Task Force
AMERICAN NEWSPAPER PUBLISHERS ASSOCIATION
The Newspaper Center
Reston, Virginia

FINAL REPORT
July 1990

By
FRANKLIN ASSOCIATES, LTD.
William E. Franklin
Amy Newton
Kevin Higgins

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THE STATES' ROLE IN DOCUMENTING THE RECOVERY AND RECOVERABILITY OF NEWSPAPERS FOR RECYCLING

BACKGROUND

There is intense interest in the collection (supply) and collectability of newspapers (ONP) to serve as raw material for production of recycled newsprint, other recycled paper products, or other uses such as insulation. On the one hand, some curbside programs have been delayed or dropped with ONP prices to collectors and even to paper mills at zero dollars or below and an apparent oversupply situation. On the other hand, newsprint producers and other users of ONP are attempting to determine if they will be able to obtain an adequate supply of acceptable quality ONP at a cost that makes deinking and recycling cost effective. Under present ONP market conditions a "tight" supply situation seems unlikely. However, if 2 to 3 million tons of new capacity are committed and in place by 1995, as some experts have predicted, then a much different situation could prevail.

In the last two to three years a number of significant events have taken place. Taken together these events are leading to structural changes in newsprint production, newspaper publishing, and ONP collection and use. Specifically:

1. Via solid waste management legislation, a number of states (and some local governments) have put or are putting in place mandatory recycling programs, recycling goals, and goals relating specifically to recycled newsprint.

2. A new collection infrastructure is being put in place for recyclable materials, especially ONP, whereby local governments are implementing (curbside) collection and processing programs.

3. Newspaper publishers, on their own initiative, or via voluntary or legislated agreements, have created a demand for recycled newsprint that will utilize, by 1995, two to three million tons of ONP (and old magazines) for which demand did not exist in 1989.

4. Newsprint producers have committed capital investment funds at 12 mills in North America between early 1989 and July 1990. More substantial commitments are expected to follow, resulting in new capacity in North America to utilize two, three, or even four million tons annually of ONP and old magazines by 1995 above

that utilized in 1988. Other uses of ONP, including exports, may expand significantly too.

With state and local governments directly involved and creating a collection and processing infrastructure that may displace in whole or in part the traditional voluntary collection and waste paper processing system, the need for timely information on collection and collectability of ONP becomes a key question. There are good reasons:

1. States and local governments are deeply involved in goal setting for recovery of materials from municipal solid waste and are urging agreements on recycled paper content of newsprint (and other products).

2. These governments and their agencies need an information system and database to measure their progress toward recycling goals.

3. Newsprint producers and newspaper publishers face significant policy decisions and capital investment commitments. They also need access to collection and collectability information, especially on ONP. In addition, they too need a basis on which to measure success against their own goals and those of the states.

4. The American Newspaper Publishers Association (ANPA); the American Paper Institute (API); and the Canadian Pulp and Paper Association (CPPA) individually and collectively provide excellent records and statistics on newsprint production and consumption, waste paper utilization in mills, exports, and other uses. Their data systems are without peer with respect to demand for their products and utilization of waste paper. There is not, however, a comprehensive database or information system which reports collection and/or collectability of ONP on a geographic basis.

PURPOSE AND OBJECTIVE OF THIS STUDY

There is no information system or database linking solid waste management goals and action on collectability and collection (of ONP) with the users of ONP, be they exporters, paperboard mills, newsprint mills, insulation products, or others.

This study and report was designed to document, on a state-by-state basis, the extent to which government agencies are developing a data collection and information system. The broad objective was to identify relevant solid waste management legislation, recycling goals, and what is known about ONP recovery programs and quantities recovered.

There are many audiences for this type of information: federal, state, and local legislative bodies; federal, state, and local agencies and professionals in the solid waste and recycling fields; newsprint (and other paper) producers in North America; waste paper brokers and dealers; private waste haulers and other collectors/processors of recyclable materials; newspaper publishers and commercial printers; railroad and trucking companies; environmental groups; and citizen groups.

SUMMARY OF KEY FINDINGS

In early June 1990, a complete telephone survey was made of all 50 states plus Washington, DC. Interviews with the agency(ies) responsibile for solid waste and recycling programs revealed the following key findings:

1. Information and database systems vary widely across the United States. Several states, especially in the Northeast, the North Central, and Pacific regions, are developing useful information systems.

2. There is very little information on the generation of ONP, the collectability of ONP, and the actual collection of ONP available public agencies today.

3. Consequently, there is limited information on progress towards recovery and recycling goals set in the states. There are, however, some notable exceptions mentioned later.

4. There is only a vague awareness among solid waste recycling officials that new demand for ONP could strain collection systems within two years. There is only limited linkage of new processing centers to transportation modes for long-distance movement of recyclables. Stated another way, state agencies have generally not determined a need to link information on generation, collection, and collectability to market development efforts. Some have, but they are exceptions.

5. Finally, the development of an information and data system is a major need at the state level, especially in those states most actively pursuing recycling goals. At the same time, there are substantive efforts along these lines in several states.

SURVEY DESIGN AND INFORMATION

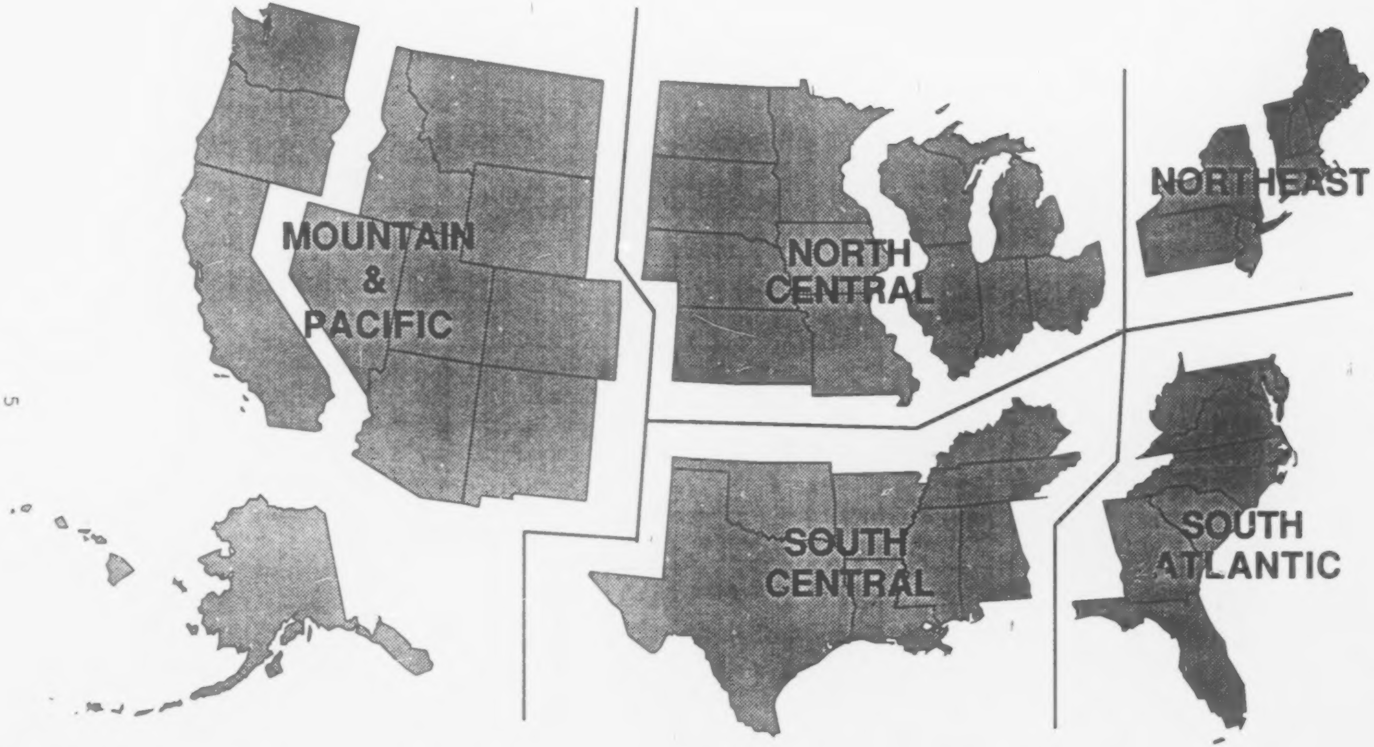
The telephone survey conducted by FAL staff sought the following information:

1. The state agency and persons with legislative or administrative responsibility for solid waste management and recycling programs.
2. The type of legislation or administrative goal(s) relating to reduction or recycling.
3. Whether local or regional solid waste management plans are required.
4. Whether there are specific recycled newsprint goals or requirements.
5. The number of curbside collection programs in place and the number of residences served.
6. The number of material recovery facilities (MRFs) in place.
7. Whether the state agency maintains formal or informal contacts with cities, counties, and/or regional agencies on recycling programs.
8. Any information on ONP generation, collectability and/or collections including tonnages, if known, trends, and where the ONP is marketed.
9. Finally, are there plans to install or implement or improve a database system for recycling information?

ANALYSIS OF SURVEY RESULTS

The map which follows shows the geographic areas that the states were grouped into. The five-page table is a region-by-region and state-by-state summary of the survey results for the nine categories of information sought. A summary and analysis of the results follow. The survey was conducted in early June 1990 and therefore reflects the status in each state as of that time. Some programs are developing so rapidly that tracking their progress is a "moving target" situation; future plans are noted where the information was available.

More than half of the states (26 of them) maintain formal or informal contacts with county/city agencies in order to obtain information about recycling at the local level. In the Northeast and North Central regions, 16 of the 21 states maintain contacts; the South Atlantic and South Central regions have 8 of 17 states.


MOUNTAIN
&
PACIFIC
NORTH
CENTRAL
NORTHEAST
SOUTH
CENTRAL
SOUTH
ATLANTIC

U.S. REGIONS

State Documentation of Newspaper Recycling and Relevant State Mandatory Legislation

Northeast: Region

New England/Mid-Atlantic

	State Mandatory SWM Legislation			State Records on the Collection of Recyclables							
				Curbside Recycling				ONP Generation/Collection Records			Plans for Database System for Recycling
State:	Reduction/Recycle Goal (percent/year)	Local/ Regional MSW Plans	Recycled Newsprint Consumption	number of programs	number of homes served	Number of MRFs(a)	County/City Contacts	Generation of ONP/ Tonnage Recovered	ONP Collection Trend	Where ONP is Sold/ Price Range	
New England											
Connecticut	Yes 25% by 1991	Yes	20% by 1993	29	No Record	Yes	Yes	Will know in1991	Recorded a cut back in '89/'90	Garden State	Yes
Maine	No	Yes	No	No Record	No Record	No Record	Yes	50,000 tons/yr/ 5,000 tons/yr.	No Record	2 mills in Maine, 1 in Boston	Yes
Massachusetts(b)	No	Yes	No	100	No Record	1	Yes	No Record(b)	No Record	No Record	Yes
New Hampshire	No	Yes	No	No Record	No Record	No Record	Yes	No Record	No Record	No Record	Yes
Rhode Island	Yes 15% by 1990	Yes	No	16	220,000	1	Yes	4.75 lbs/wk/ household-- 23,000 tons	No Record	No Record	Yes
Vermont	No	Yes	25% by '91 (pre-filed)	1	3,000	Info. Being Compiled	Yes	Info. Being Compiled	Yes	No Record	Yes
Mid-Atlantic											
New Jersey	Yes 25% in two years	Yes	pending	450	No Record	11	Yes	767,483 tons/ 359,879 in 1988	Recorded no change in '89/'90	50% (Garden State) $20.-$30	Yes, existent
New York	No	Yes	No	80	No Record	8	Yes	1.4 million tons/ 400,000 tons	Yes	Garden State, Thruway Canada/$20.-$15	Yes,for MRF's >5 TPD
Pennsylvania	Yes 25% by 1997	Yes	No	300	890,000	8	Yes	736,000 tons/ 70,000 tons in 1988	No Record	No Record	Yes, existent

(a) For this survey, a MRF was described as any facility that receives, processes, and markets mixed recyclable materials that are source seperated from municipal waste streams.
(b) Massachusetts' Waste Management Division is currently surveying the state to determine generation/recovery rates of recyclables. Information should be available by Sept. '90.

Source: Franklin Associates, Ltd.

State Documentation (continued):

South Atlantic Region

	State Mandatory SWM Legislation			State Records on the Collection of Recyclables							
				Curbside Recycling				ONP Generation/Collection Records			Plans for Database System for Recycling
State:	Reduction/Recycle Goal (percent/year)	Local/ Regional MSW Plans	Recycled Newsprint Consumption	number of programs	number of homes served	Number of MRFs	County/City Contacts	Generation of ONP/ Tonnage Recovered	ONP Collection Trend	Where ONP is Sold/ Price Range	
South Atlantic											
Delaware	No	No	No	0	0	No Record	No	No Record	No Record	RDF	No
District of Columbia	Yes 35% by 1992, 45% by 1994	Yes	No	One city-wide program	125,000	No Record	No	10 lbs/wk/ household-- No Record	Recorded no change in '89/'90	$5-$15/ton	Yes, existent
Florida	Yes 30% by 1995	Yes	Yes 50% by '92	20	750,000	Info. avail. by November	Yes	Info. avail. by November	Informal awareness of some collection cutbacks	Southeast Paper/ $10-20 per ton	Yes
Georgia	No	Yes	No	2	No Record	No Record	Yes	No Record	No Record	Southeast Paper/ $10-15 per ton	No
Maryland	Yes 20% by 1994	Yes	40% by '94	8	110,235	1	Yes	282,815 tons/yr/ 52,498	Recorded a cut back in '89/'90	Chesapeake P-board, Suburban Insulation	No
North Carolina	No	Yes	No	No Record	No Record	1	Yes	No Record	No Record	No Record	Yes
South Carolina	No	No	No	1	No Record	No Record	No	No Record	No Record	No Record	No
Virginia	Yes 25% by 1995	Yes	No	20	No Record	No Record	Yes	No Record	No Record	No Record	Yes
West Virginia	No	No	No	No Record	No Record	No Record	Yes	No Record	No Record	No Record	No

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Source: Franklin Associates, Ltd.

State Documentation (continued):
South Central Region

	State Mandatory SWM Legislation			State Records on the Collection of Recyclables							
				Curbside Recycling				ONP Generation/Collection Records			Plans for Database System for Recycling
State:	Reduction/Recycle Goal (percent/year)	Local/ Regional MSW Plans	Recycled Newsprint Consumption	number of programs	number of homes served	Number of MRFs	County/City Contacts	Generation of ONP/ Tonnage Recovered	ONP Collection Trend	Where ONP is Sold/ Price Range	
South Central											
Alabama	No	No	No	2	No Record	No Record	Yes	No Record	No Record	No Record	Yes
Arkansas	No	No	No	No Record	No Record	No Record	No	No Record	No Record	Arkansas Craft/ No Record	Yes
Kentucky	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Louisiana	No	Yes	No	6	2% of all homes	No Record	Yes	No Record	No Record	Southeast Recycling $10-15 per ton	Yes
Mississippi	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Oklahoma	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Tennessee	No	Yes	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Texas	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No

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Source: Franklin Associates, Ltd.

State Documentation (continued):

North Central Region

East North Central/West North Central

	State Mandatory SWM Legislation			State Records on the Collection of Recyclables							
				Curbside Recycling				ONP Generation/Collection Records			Plans for Database System for Recycling
State:	Reduction/Recycle Goal (percent/year)	Local/ Regional MSW Plans	Recycled Newsprint Consumption	number of programs	number of homes served	Number of MRFs	County/City Contacts	Generation of ONP/ Tonnage Recovered	ONP Collection Trend	Where ONP is Sold/ Price Range	
East North Central											
Illinois	Yes 25% by 2000(a)	Yes	10% by '92, 50% by '96 (pending)	64	450000	No Record	Yes	No Record	No Record	FSC Paper Mill/ $10-19 per ton	Yes
Indiana	No	No	No	17	No Record	No Record	Yes	No Record	No Record	No Record	Yes
Michigan	No	Yes	No	24	No Record	No Record	Yes	No Record	No Record	No Record	No
Ohio	Yes 25% by 1994	Yes	No	No Record	No Record	No Record	Yes	No Record	No Record	No Record	Yes
Wisconsin	No	Yes	5% by '91, 20% by 2003 (pending)	No Record	No Record	No Record	Yes	No Record	No Record	No Record	No
West North Central											
Iowa	No	Yes	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Kansas	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Minnesota(b)	No	Yes	No	389	No Record	No Record	Yes	No Record	No Record	No Record	Yes
Missouri	No	No	10% by'92, 50% by '96 (pending)	No Record	No Record	No Record	Yes	No Record	No Record	No Record	No
Nebraska	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	Yes
North Dakota	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
South Dakota	No	No	10% by '92, 50% by '96	No Record	No Record	No Record	No	No Record	No Record	No Record	No

(a) Mandatory for Chicago and for counties with pop.>100,000: 15% reduction within 3 yrs. of approval date of SWM plans; 25% within 5 yrs. of approval of SWM plans

(b) There are no generation/recovery records kept on a state-wide basis, but the Metro Council keeps extensive records on the Minneapolis-St. Paul metro area.

Source: Franklin Associates, Ltd.

State Documentation (continued):
Mountain and Pacific Regions

State:	State Mandatory SWM Legislation			State Records on the Collection of Recyclables							
				Curbside Recycling				ONP Generation/Collection Records			Plans for Database System for Recycling
	Reduction/Recycle Goal (percent/year)	Local/ Regional MSW Plans	Recycled Newsprint Consumption	number of programs	number of homes served	Number of MRFs	County/City Contacts	Generation of ONP/ Tonnage Recovered	ONP Collection Trend	Where ONP is Sold/ Price Range	
Mountain											
Arizona	No	No	No	7	No Record	No Record	No	No Record	No Record	No Record	No
Colorado	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Idaho	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Montana	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Nevada	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
New Mexico	No	Yes	No	4	No Record	No Record	No	No Record	No Record	No Record	No
Utah	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Wyoming	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Pacific											
Alaska	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
California	Yes 25% by 1995	Yes	25% by '91	No Record	No Record	No Record	Yes	No Record	No Record	No Record	Yes
Hawaii	No	No	No	No Record	No Record	No Record	No	No Record	No Record	No Record	No
Oregon	No	No	Failed	108	No Record	No Record	Yes	No record	No Record	Smurfit Paper/ $40 per ton	Yes
Washington	No	Yes	No	17	No Record	No Record	Yes	53% recovery rate/ 191,000 tons	No Record	No Record	Yes

Source: Franklin Associates, Ltd.

However, the Mountain/Pacific region has only 3 out of 13 states maintaining contacts at the county and/or city level.

Fewer state agencies have knowledge of existing community recycling programs. Twenty-one state agencies (38 percent) know the number of programs in their respective states. Again, the Northeast has the best record with 7 of 9 states having good information on curbside programs; about half of the states in the Southern regions combined have records on the number of programs. However, the North Central has only 4 of its 12 states documenting curbside collection. This is similar to the Mountain/Pacific region, which has only 4 of its 13 states in the region keeping records on curbside collection programs.

There are fewer records kept on where ONP is utilized. Only 12 states (23 percent) could identify the mills or other end users where their ONP was being sent. Only 8 states knew how much was generated or how much was being recovered, 6 of which are in the Northeast region.

In general, the Northeastern states have fairly good records on recycling and ONP recovery. The North Central states are similar to the East on maintaining contacts, but this region is more like the Southern region with respect to knowledge of curbside programs. The West Central, Western, and Southwestern regions have minimal information. Except for Washington and Oregon, the Pacific region has little information gathered at the state level.

Although state records appear to be inadequate nationwide, a number of respondents indicated other sources of information (e.g., mills and private recyclers). Furthermore, New York and Connecticut reported that when the local solid waste management plans are submitted, records on curbside recovery and other recycling information will be available.

Twenty-seven of the states require solid waste management plans for their counties and/or cities. Additionally, many states have plans to start a database system for maintaining recycling information. However, the results are skewed, with the Northeast having all of its states planning a database system. The North Central region has 5 of 12 states with plans, while the Mountain/Pacific region has 3 of 13. The South Atlantic and South Central regions (17 states) have 7 states with plans for a database system for collecting information.

Two pieces of information—the number of curbside programs and ONP recovery rate—seem to be particularly important. To determine how a state might obtain information on curbside programs or ONP recovery, we made return phone calls to those states that had records.

Those who reported having only a few curbside programs (under ten) indicated that they know the number through informal information sources. Thus, New Mexico, South Carolina, Arizona, Alabama, Louisiana, and Georgia know about the number of curbside programs from newspaper articles or from participating in local recycling committees.

Others know about the number of curbside programs from surveys. Washington, Maryland, Connecticut, Michigan, Minnesota, Indiana, and Virginia all know about the number of curbside programs from regularly conducted surveys.

Still others know about curbside programs because localities applied for grants. The relevant information was collected under grant proposals and periodic reporting required of localities under the programs. New York, Illinois, Pennsylvania, and Rhode Island all receive their information on curbside programs through grant proposals.

Finally, there are some reporting regulations. Oregon, the only state to require curbside collection of some localities, has a Department of Environmental Quality that issues rules for trash haulers to submit information on a quarterly basis.

ONP recovery information is obtained mostly through market studies. New Jersey, however, requires that municipalities and counties send in reports on what is generated and what is recovered.

In order to determine why certain states have better records than others on recycling and ONP recovery, we investigated whether or not those states with good records have any common characteristics. Two recent published surveys (1)(2) provided us with comprehensive information regarding solid waste legislative and recycling activities in the states. These two articles outline the major trends in the states. We used these sources as the basis for our own survey to determine whether or not states with good records have any common characteristics.

Currently, 24 states have numerical waste reduction/ recycling goals. Of these states, 15 (62.5 percent) have records on curbside programs or ONP recovery. Of the nine states with mandatory goals, five (55.5 percent) have records on curbside programs or ONP recovery—Rhode Island, New Jersey, Maryland, Pennsylvania, and Washington, D.C. It appears that the state agencies do not currently need the information about curbside programs or ONP recovery in order to ensure future attainment of the goals.

New York, Pennsylvania, New Jersey, and Washington, D.C. all have passed legislation that mandates municipalities to develop recycling programs and to pass ordinances that require citizen participation (1). All of these states have records on both curbside programs and ONP recovery. Of those states that require only that communities provide the opportunity to their citizens to recycle (as opposed to requiring it), 83 percent of these states have records on curbside programs. It appears that when laws mandating recycling and citizen participation are in effect that state environmental agencies are more likely to be funded to maintain records on curbside recycling.

A final potential legislative index of good recordkeeping is the requirement that localities submit solid waste management plans. Of the 27 states that require these plans, 17 (63 percent) have records on curbside programs or ONP recovery. The correlation between requiring local solid waste laws and having informative records is not very high at the moment. However, since these plans will provide information, they may be good indices of recordkeeping in the future when they are processed by the agencies.

Besides legislative activity, there are other aspects of solid waste management that might serve as signs of the degree of recordkeeping and information systems. According to one source (2), recycling rates are higher than the national average in 11 states (Washington, Oregon, New Jersey, Minnesota, Colorado, Rhode Island, California, Vermont, New York, Nebraska, and Virginia). Seven states (65 percent) have records on ONP recovery. In general, those states with higher recycling rates appear to keep better records.

According to this same survey (2), 41 states have at least one curbside recycling program. Of these states, we were able to identify 21 that know how many programs they have. Of those states identified in the survey (2) as having over 100 programs (New Jersey, Pennsylvania, Minnesota, Oregon, and California), four were able to give us a figure. On the other hand, many states with under 100 curbside programs according to the survey (2), (e.g., Florida with 42, Ohio with 26, and Virginia with 15) do not appear to keep records on the number of programs within their state environmental agencies.

In conclusion, our findings are that the states in the Northeast region, those with higher recycling rates, those with many curbside programs, and those that have legislation mandating recycling appear to have the best records on the number of curbside programs and/or ONP recovery. Legislation mandating recycling in localities appears to be the best index of good recordkeeping. In the future, records for the states that are to receive solid waste management plans may be more thorough and informative. However, today there is virtually no way for states or recyclers to provide useful information to each other on an ongoing and timely basis.

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Appendix A

STATE AGENCIES CONTACTED

State	Reporting Agency	Telephone
Alabama	Dept. of Environmental Management, Solid Waste Division	(205)271-7761
Alaska	Dept. of Environ. Conservation, Solid and Hazardous Waste Section	(907)465-2671
Arizona	Dept. of Environmental Quality, Office of Waste Programs	(602)257-6980
Arkansas	Dept. of Pollution Control and Ecology, Office of Solid Waste	(501)562-7444
California	Dept. of Conservation	(916)372-2774
Colorado	Office of Energy Conservation	(303)894-2144
Connecticut	Dept. of Environmental Protection, Solid Waste Bureau	(203)566-8722
Deleware	Solid Waste Authority	(303)736-5361
D.C.	Dept. of Public Works	(202)939-7166
Florida	Dept. of Environmental Regulation, Solid Waste Section	(904)922-6104
Georgia	Dept. of Natural Resources, Land Protection Branch	(404)656-2833
Hawaii	Dept. of Health and Environmental Quality	(808)548-4139
Idaho	Dept. of Health, Idaho Waste Reduction Assistance Program	(208)334-6664
Illinois	Dept. of Energy and Natural Resources, Solid Waste Division	(312)814-3958
Indiana	Dept. of Environmental Management	(317)232-4473
Iowa	Air Quality and Solid Waste Bureau, Waste Management Division	(515)281-8946
Kansas	Dept. of Health and Environment	(913)296-1500
Kentucky	Dept. of Environmental Protection, Division of Waste Management	(502)564-6716
Louisiana	Dept. of Environmental Quality, Solid Waste Division	(504)342-1216
Maine	Dept. of Environmental Protection, Waste Management Division	(207)289-5300
Maryland	Dept. of Environment, Hazardous and Solid Waste Division	(301)631-3315
Massachusetts	Dept. of Environmental Protection, Waste Management Division	(617)292-5962
Michigan	Dept. of Natural Resources, Resource Recovery Division	(517)373-2730
Minnesota	Office of Waste Management	(612)649-5793

(Continued)

(State Agencies Continued)

Mississippi	Bureau of Pollution Control, Waste Minimization Division	(601)961-5241
Missouri	Dept. of Natural Resources, Waste Management Program	(314)751-3176
Montana	Dept. of Health, Solid and Hazardous Waste Bureau	(406)444-1430
Nebraska	Dept. of Environmental Control, Litter Reduction and Recycling Division	(402)471-4210
Nevada	Dept. of Conservation and Nat. Resources, Environ. Protection Agency	(702)687-5872
New Hampshire	Dept. of Environmental Services, Waste Management Division	(603)271-3713
New Jersey	Dept. of Environmental Protection, Office of Recycling	(609)530-4001
New Mexico	Dept. of Health and Environment, Environmental Health Division	(505)827-2953
New York	Dept. of Environ. Conservation, Bur. of Waste Reduction and Recycling	(518)457-3966
North Carolina	Dept. of Environ., Health, and Nat. Resources, Solid Waste Section	(919)733-0692
North Dakota	Dept. of Health, Division of Environmental Waste Management	(701)224-2366
Ohio	Dept. of Natural Resources, Division of Litter Reduction and Recycling	(614)265-7061
Oklahoma	Dept. of Waste Management, Solid Waste Division	(405)271-7047
Oregon	Dept. of Environmental Quality, Division of Hazardous and Solid Waste	(503)229-6975
Pennsylvania	Dept. of Environmental Resources, Bureau of Waste Management	(717)787-7382
Rhode Island	Dept. of Environ. Management, Solid Waste Management Corporation	(401)831-4440
South Carolina	Dept. of Health, Bureau of Solid and Hazardous Waste Management	(803)734-5200
South Dakota	Dept. of Water and Natural Resources, Solid Waste Division	(605)773-3153
Tennessee	Dept. of Health and Environment, Division of Solid Waste Management	(615)741-3424
Texas	Dept. of Health, Division of Solid Waste Management	(512)458-7271
Utah	Dept. of Health, Bureau of Solid and Hazardous Waste Management	(801)538-6170
Vermont	Dept. of Environmental Conservation, Solid Waste Division	(802)244-7831
Virginia	Dept. of Waste Management	(804)786-8679
Washington	Dept. of Ecology, Division of Waste Reduction and Recycling	(206)438-7773
West Virginia	Dept. of Natural Resources, Office of Solid Waste Management	(304)348-6350
Wisconsin	Dept. of Natural Resources, Bureau of Solid Waste Management	(606)266-1327
Wyoming	Dept. of Environmental Quality, Solid Waste Management Program	(307)777-7752

Appendix B

SUMMARY OF LEGISLATION AND OTHER ACTIVITY ON NEWSPRINT RECYCLING

STATE AND LOCAL LEGISLATION

	Year
Mandated Markets/Content (7)	
Arizona (awaiting governor's signature)	1990
California	1989
Connecticut	1990
Illinois (awaiting governor's signature)	1990
Maryland	1990
Missouri	1990
Wisconsin	1990
Suffolk County, NY	1990
Virgin Fiber Newsprint Tax (1)	
Florida	1988
Voluntary Recycled Newsprint Use Agreements	
• **Governor's Office or Agency (5)**	
New York	1989
Pennsylvania	1989
Massachusetts	1990
Michigan	1990
Vermont	1990
• **Legislative (1)**	
Iowa	1990
Recycled Newsprint Study Task Forces (3)	
Kentucky	1990
New Hampshire	1990
Virginia	1990
States and Localities Active on Recycled Newsprint	
• **States (22)** Arizona, Illinois, Kentucky, Louisiana, Maine, Minnesota, Missouri, Massachusetts, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, South Dakota, Virginia, Washington, West Virginia, and Wisconsin.	1990
• **Localities (9)** Evanston IL (1989); Chicago IL (1990); Honolulu HI (1990); Los Angeles CA (1990); Philadelphia PA (1990); Suffolk County NY (1990); Washington DC (1990); Lake Mary FL; Riverside CA.	

Source: American Newspaper Publishers Association
July 1990